C. K. Mann

Jefferson Medical College

1926-28

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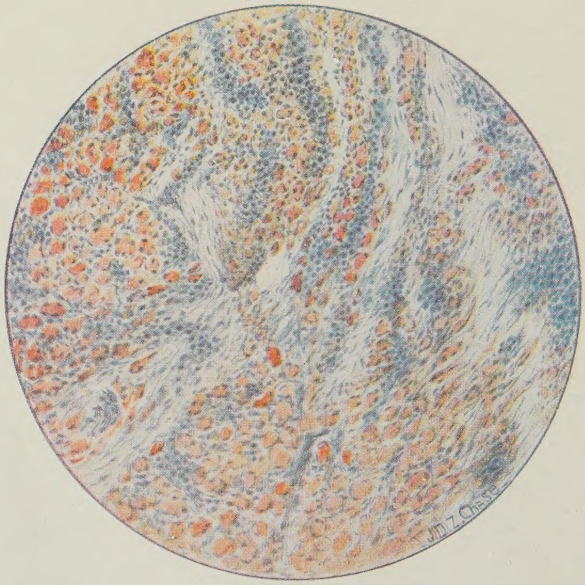
PLATE I

Fig. 1

Section Showing Increased Pigment in Otherwise Normal Skin.

Clinical picture of case under Lentigo (freckles). Water-color painting.

Fig. 2



Water-color Painting of a Section Stained with Scarlet Red.

The fatty changes are shown by the orange-yellow color. The fibroblasts also exhibit the fat reaction. Xanthoma tuberosum multiplex.

DISEASES OF THE SKIN

BY

FRANK CROZER KNOWLES, M.D.

PROFESSOR OF DERMATOLOGY, JEFFERSON MEDICAL COLLEGE; LIEUTENANT-COLONEL MEDICAL RESERVE CORPS, U. S. A.; DERMATOLOGIST TO THE PHILADELPHIA GENERAL, THE PRESBYTERIAN, THE CHILDREN'S AND THE BABIES' HOSPITALS; CHIEF-OF-CLINIC, DERMATOLOGICAL DEPARTMENT, PENNSYLVANIA HOSPITAL; CONSULTING DERMATOLOGIST TO THE CHURCH HOME FOR CHILDREN, THE BAPTIST ORPHANAGE, THE SOUTHERN HOME FOR DESTITUTE CHILDREN, THE EASTERN STATE PENITENTIARY AND THE BURD SCHOOL; MEMBER OF THE AMERICAN DERMATOLOGICAL ASSOCIATION; FELLOW OF THE COLLEGE OF PHYSICIANS, ETC.

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WITH 229 ILLUSTRATIONS AND 14 PLATES

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THIS VOLUME

IS DEDICATED TO THOSE EMINENT DERMATOLOGISTS

WITH WHOM THE WRITER HAS BEEN SO CLOSELY ASSOCIATED, THE LATE

DRS. LOUIS A. DUHRING AND HENRY W. STELWAGON

AND

DRS. ARTHUR VAN HARLINGEN, MILTON B. HARTZELL AND CHARLES N. DAVIS

WITH FEELINGS OF THE GREATEST RESPECT AND ESTEEM

PREFACE.

Many advances have been made in the dermatological field during the last few years, and a complete revision has proved necessary in the present volume.

Practical diagnostic tables have been added, showing the regional distribution of the common skin diseases and the types of lesions tending to involve certain areas.

The section on roentgen-ray therapy has been entirely rewritten, and this important method of treatment has been modernized. Radium therapy has also been carefully revised.

Food tests and other foreign protein tests are assuming greater importance, and a description is given of these, with the method of application and the results obtained.

Bacterial and fungus origin of dermatological conditions are enhancing our knowledge and these are fully outlined. The section on ringworm fungi and eczematoid ringworm has been rewritten.

Cancer of the skin has been dealt with according to whether it originates from the prickle cell or basal layer.

The description of the treatment and diagnostic tests of syphilis are given in greater detail.

The unusual and rare diseases have not been neglected, and those recently reported have been added to the present work.

The endeavor has been made, as in the first edition, to make this volume of practical use to the student and general practitioner.

Thirty new photographs have been added, in addition to those taking the place of a few, less satisfactory, which have been eliminated.

Indebtedness should be acknowledged to my associates, Drs. Edward F. Corson, A. Strauss, David Sidlick and Henry B. Decker, who have assisted in the preparation of various sections. Photographs have been supplied, and thanks are due to Dr. A. Haines Lippincott, A. Strauss and M. B. Hartzell. J. B. Lippincott Company have very kindly allowed me to use a few photographs from some of their publications. Three additional dermatological treatises, those of Hartzell, Ormsby and Hazen, have been used largely in the preparation of this edition, in addition to those mentioned in a former preface.

The publishers of this work have been uniformly kind, thoughtful and considerate.

F. C. K.

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DISEASES OF THE SKIN.

ANATOMY AND PHYSIOLOGY.

EMBRYONIC DEVELOPMENT OF THE SKIN AND APPENDAGES.

Embryologically, the skin consists of two layers, the epidermis and the corium.

The *corium* is developed in intra-uterine life from the superficial layer of the *mesoblast* (the "skin-plate" of Remak). Its lower portion is first observed as a myxofibrous structure, which is replaced between the seventh and eighth months of embryonal life by a collagenous substance from which the bundles of connective tissue develop.

The *epidermis* arises from the *ectoderm*, and is not projected upon the papillary layer until the fourth month of fetal life. The prickle cells begin as a single row of cells, to which are added three or more rows by the fifth month.

The *subcutaneous tissue*, or hypoderm, is differentiated from the corium between the third and the fourth months of embryonal life.

The *sweat glands* develop in the fifth month of fetal life as buds, projecting downward from the prickle layer of the epidermis.

The *sebaceous glands* make their appearance early in embryonal life, developing from minute, lateral, bud-like prolongations derived from the outer root sheath of the hair.

The *hairs* are first developed in the third month of fetal existence.

The *nail* begins to form in the third month of intra-uterine life. In the fifth month the first trace of the definite nail is observed in the form of a small lenticular collection of prickle cells at the nail fold.

ANATOMY OF THE SKIN.

The skin consists of the *epidermis*, the most superficial portion; the *corium*, the middle layer, and the *subcutaneous tissue*. The latter is a continuation of the corium.

The **epidermis**, which is also termed the cuticle, cuticula, scarf skin or epithelial layer, is divided into four parts: The stratum

corneum, the stratum lucidum, the stratum granulosum, and the stratum mucosum.

The *stratum corneum* (horny layer) consists of several rows of elongated, superimposed, flattened epithelial cells. The cells in

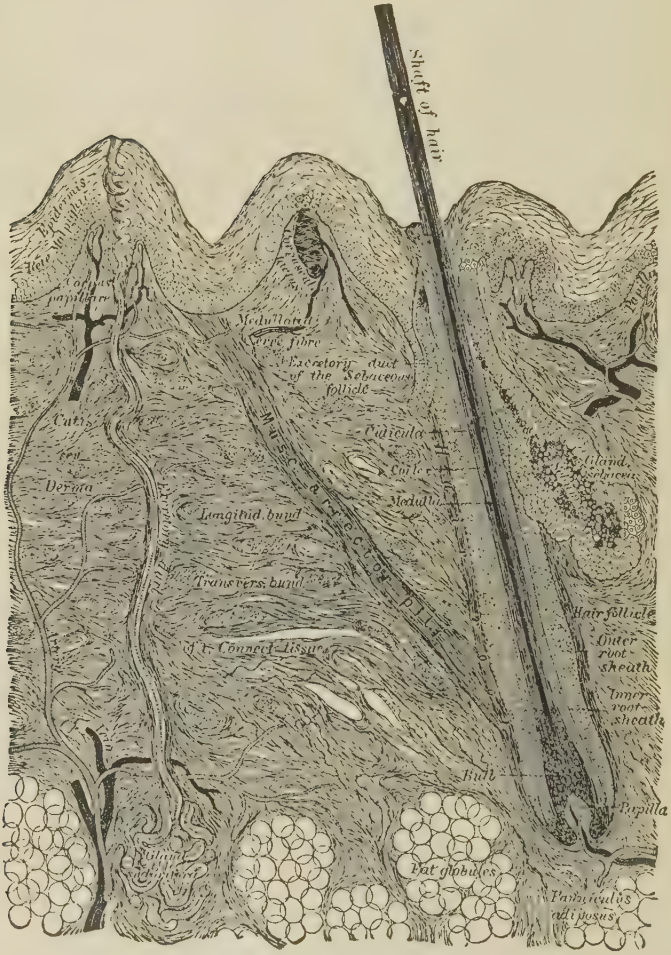


Fig. 1.—Vertical section through the skin. Diagrammatic. (After Heitzmann.)

contact with the external air contain no nucleus, and appear simply as thin, flattened, dry scales. The individual cells are polygonal in shape and usually show vacuoles, due to the loss of nuclei. This layer varies greatly in thickness, being thickest on the palms

of the hands and the soles of the feet and thinnest on the eyelids and prepuce.

The *stratum lucidum* (clear or shiny layer) is composed of glistening, translucent, flattened epithelial cells. This layer is probably the basal portion of the stratum corneum, exhibiting somewhat different staining characteristics.

The *stratum granulosum* (granular layer) lies below the stratum lucidum and immediately above the rete, of which it is probably the uppermost portion. It consists of about three rows of flattened granular cells. The nature of these granules is not absolutely determined; Ranvier considers they contain *eleidin*, while Waldeyer has reported the presence of *keratohyalin*. These granules very probably have some function in the cornification of the upper layers of the skin.

The *stratum mucosum* (mucous layer, rete Malpighii, rete mucosum, germ layer, prickle-cell layer) is a very important layer, and is affected in a large number of the pathological conditions of the skin. It lies immediately upon the papillary portion of the corium, and the finger-like projections of the latter fit between the dipping-down pegs of the rete.

This layer consists of three types of cells: Prickle cells, cuboidal cells and basal cells.

The prickle-cell layer usually consists of five to eight rows of cells, which are large and each of which contains a central nucleus. These cells have radiating spines or prickles, hence the term "prickle cells." These cells stain with the basal dyes, although not as intensely as do the basal cells.

The cuboidal cells lie between the prickle and basal cells, and consist of but one or two rows; they are to be regarded as basal cells that have not as yet assumed all the characteristics of the more highly differentiated prickle cells. The cells are cuboidal in shape, are rather larger than the basal cells and lack fully-developed intracellular bridges.

The basal cells form the lowest layer of the rete. The cells consist of but one layer and are oblong in shape, being arranged in a columnal manner, vertically to the basement membrane, if we consider that one exists. The nuclei occupy a central position.

The **corium** (derma, cutis vera, true skin) is of a dense structure in its upper portion and of a looser mesh in the lower part. It consists of white fibrous tissue, interspersed with elastic fibers and non-striped muscles. Bloodvessels, nerves, lymphatics, nerve corpuscles, hair, sweat and sebaceous glands are also present. It is divided into two portions, the *pars papillaris* (papillary layer) and the *pars reticularis* (reticular layer).

The *papillary layer* consists of innumerable papillæ of varying

size which interlock with the downward projections of the rete layer of the epidermis. These elevations are composed of closely arranged bundles of fibro-elastic tissue, and are abundantly supplied with bloodvessels, nerves, lymphatics and nerve corpuscles. The number of these papillæ are beyond computation. According to Sappey, there are approximately 150,000,000 over the entire skin surface. The greatest number are found where the tactile sense or sensation is most acute, as on the terminal phalanges, the penis, the clitoris, the nipples, etc.

The *reticular layer* is made up of a more loosely arranged stroma; the fibrous tissue having a coarser consistency, and there is an absence of papillæ.

The **subcutaneous tissue**, or hypoderm, is a deeper continuation of the reticular layer of the corium, and there is no distinct demarcation between the two portions. It is composed of interlocking and anastomosing bundles of fibrous tissue, and in the lower portion fat cells (*panniculus adiposus*) are found in rhomboidal spaces.

Bloodvessels.—Two horizontal and parallel plexuses are present in the integument; the superficial, supplying the papillary layer and sending branches into the papillæ, into the reticular portion of the corium, to the upper part of the tubules of the sweat glands, to the hair follicles and the sebaceous glands; and a deep trunk, vascularizing the reticular portion of the corium, the subcutaneous tissues, and sending ramifications to the lower portion of the sweat glands, the fat cells, the hair follicles and the deeper sebaceous glands. The veins of the skin have the same distribution as the arteries. The epidermis has no blood supply.

Lymphatics.—There is a profuse lymph supply in the skin which is carried by juice spaces, usually without an independent wall, and lymphatic vessels. The uppermost lymphatic vessels follow the course of the subpapillary vascular channels, while the lower lymph system runs parallel with the large vascular trunks in the lower portion of the corium and the subcutaneous layer. Lymph spaces are found in the corium and mucous layer of the epidermis. Numerous small lymphatics connect, in all portions of the skin, with the lymph spaces. Lymph passes up from the lymph spaces in the papillary layer of the corium and circulates in the interepithelial portions of the epidermis.

Nerve Supply.—There is an abundant supply of nerve tissue in the skin, consisting of medullated and non-medullated fibers, having the same distribution as the vascular system. These fibers are supplied from horizontally disposed bundles of nerve twigs in the subcutaneous tissue. The nerve mechanism also consists of motor and vasomotor nerves, Pacinian corpuscles, tactile corpuscles, touch cells and corpuscles of Krause.

Non-medullated fibers are extremely delicate twigs that are found abundantly in the lower portions of the epidermis; each

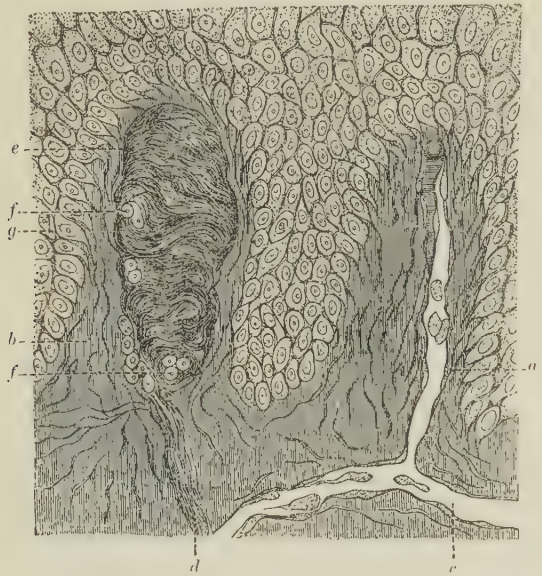


FIG. 2.—Vascular and nervous papillæ: *a*, vessel; *b*, nervous papilla; *c*, vessel; *d*, nerve fiber; *e*, corpusculum tactus; *f*, transversely divided nervous filaments; *g*, epithelia of rete. (After Biesiadecki.)

FIG. 3.—Prickle cells. (Ormsby.)

prickle cell is supplied with a pair of these filaments. Non-medullated threads cannot be recognized histologically above the

granular layer (stratum granulosum). The sheaths of the hairs and the ducts of the coil glands are supplied with minute branches of these nerves. These delicate elements furnish sensation in the skin.

Motor fibers are distributed to the sheaths of the bloodvessels (*vasomotor nerves*). Motor filaments are also furnished to the muscles, and trophic branches are supplied to all the secretory organs of the skin.

Medullated nerve fibers are observed in the loops in the papillæ.

Pacinian corpuscles (corpuscles of Vater) are composed of medullated nerve fibers. These bodies are ovoid in form, 2 mm. or more in diameter, and consist of a central nerve core and a concentric, nucleated, vascular capsule. The exact function of the corpuscle is unknown, but it probably has something to do with the perception of pressure and traction. These bodies are most numerous in the subcutaneous tissue of the nipples, the penis, the digits and in parts similarly sensitive.

Tactile corpuscles (corpuscles of Meissner or of Wagner) are ovoid bodies composed of medullated nerve fibers and are found in approximately one-quarter of the papillæ of the papillary layer of the corium. The corpuscles consist of minute lobules, with a homogeneous protoplasm and oval nuclei, and connective-tissue fibers, and are surrounded by a dense connective-tissue capsule. These bodies are found most abundantly on the fingers, and their function is probably to add to the acuteness of the sense of touch.

Touch cells, as described by Merkel, are oval nucleated bodies resembling cells and undergoing mitosis. They are found in the epidermis and the upper portion of the corium; chiefly in the abdominal integument.

Corpuscles of Krause (bulb corpuscles) consist of connective tissue and delicate nerve fibers, and have a rounded or oval formation. The corpuscles are distributed chiefly along the borders of the lips, the tongue, over the glans penis and the clitoris.

Muscles.—Two sets of muscular fibers are found in the skin, the striated or voluntary and the non-striated or involuntary. The *striated muscular fibers* extend from the subcutaneous tissue into the corium. This type of muscle fiber is found chiefly in the skin of the face and the neck.

Non-striated muscular fibers are observed as minute oblique bundles in connection with the glands and follicles of the skin, or as annular bands in the areola of the nipple, or as parallel rods counteracting the action of the orbicularis muscle. Layers of smooth muscle fibers are noted in the skin of the scrotum, the penis and about the nipple.

The *arrectores pilorum* are non-striated muscular fibers that

arise in the papillary portion of the corium, and are inserted into the outer layer of the hair follicle and the sebaceous gland. They have an oblique arrangement, and the bundle of involuntary muscle is surrounded by elastic fibers.

Pigment.—The coloring matter of the skin is found normally deposited in the cells composing the lower stratum of the rete layer of the epidermis, the fine granules of pigment staining both the cell body and the nucleus. The color is caused by an albuminous substance containing sulphur and called *melanin*. In the

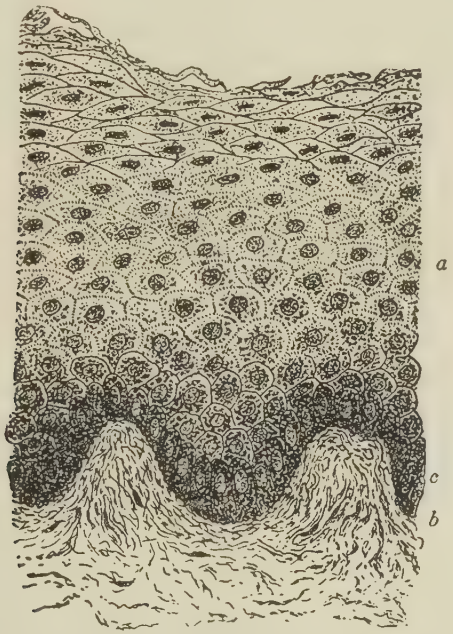


FIG. 4.—Section of negro skin, including epidermis (*a*) and papillary layer (*b*) of the corium. The pigment is contained in the deepest layer (*c*) of the epidermis. (Piersol.)

negro, the pigment may stain the epithelial cells and their nuclei, extending as high as the granular layer. There are all gradations of pigmentation, depending upon the type of the individual, whether blonde, brunette, mulatto or negro.

The source of pigment in the skin has not been positively determined. Several theories, however, have been expounded: That it is carried up by the leukocytes from the underlying subcutaneous tissue; that it is caused by the migration of the pigmented cells of the adjacent connective tissue; or that it is formed within the protoplasm of the cell *in situ*. The pigment is probably derived

from the subepidermal structures and originally obtained from the blood (Hyde).

Sweat Glands (Coil or Sudoriparous Glands).—Sweat glands consist of globular coils situated in the subcutaneous tissue and the lower portion of the corium. They empty into excretory ducts composed of a convoluted tube lined with nucleated cubical epithelial cells which traverse the corium, extending into the epidermis between the papillæ, and pursue a spiral course to the surface of the skin, where they exude their contents from a slight depression in the horny layer known as the *sweat pore*. These glands are found on all parts of the body, with the possible excep-

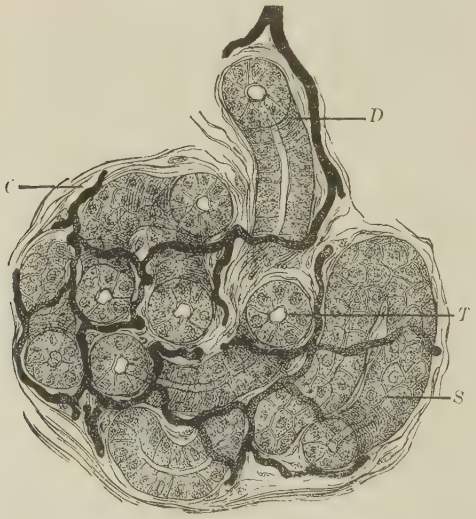


FIG. 5.—Coil of a sweat gland; *S*, tubule lined with cuboidal epithelial; *T*, central caliber of the tubule; *D*, beginning of the duct; *C*, connective tissue with injected bloodvessels. Magnified 500 diameters. (After Heitzmann.)

tion of the lips and the glans penis. The palms of the hands and the soles of the feet are abundantly supplied. The glands are multiple, of unusual size and often peculiarly arranged in certain regions, such as in the axillæ, the groins, the palms, the soles and about the anus. It has been estimated by Sappey that there are slightly over 2,000,000 of these glands in the skin.

Sweat contains about 99 per cent water, and usually is of an acid reaction. The remaining 1 per cent solids consists of sodium chloride, urea, acetic, formic, butyric, proprionic, caproic and caprylic acids; palmitin, stearin, cholesterin, earthy phosphates and sodium phosphate.

Sebaceous Glands (Oil Glands, Sebiparous Glands, Glandulæ Sebaceæ, Glandulæ Sebiferæ, Hair-follicle Glands).—Sebaceous glands are of a racemose or an acinous structure, usually connected with or in close proximity to the hair follicle, and are located in the corium. They consist of one or more pouches or lobules which empty into a common duct. They emit their contents usually

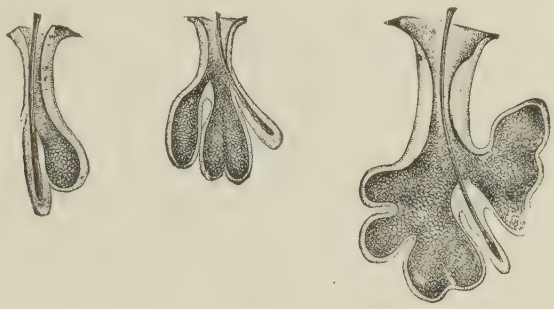


FIG. 6

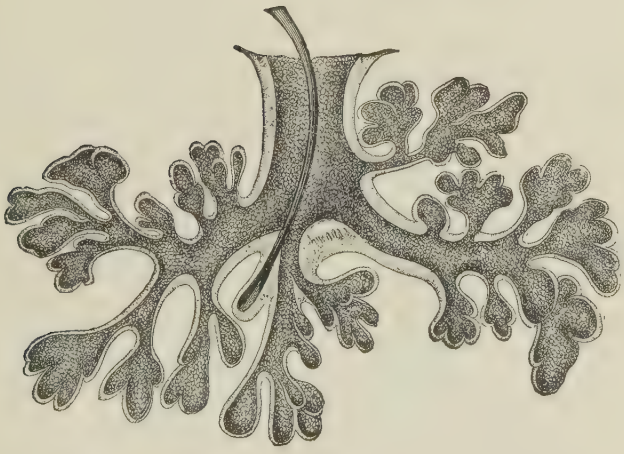


FIG. 7

FIGS. 6 and 7.—Sebaceous glands of the second class from the alæ of the nose. (After Sappey.)

between the surface of the hair and the inner root sheath of the latter. The glands in the regions where there are no hairs, such as on the glans penis, the inner surface of the prepuce, the labia minora and the red border of the lips give their contents directly to the surface. Sebaceous glands are found on most portions of the body, with the exception of the palms of the hands and the soles of the feet and the dorsal surface of the third phalanges.

The largest glands are found upon the nose, the cheeks, the eyelids (*Meibomian glands*), the areola of the nipple, the mons Veneris, the labia majora, the scrotum, about the anus, upon the glans penis and on the inner surface of the prepuce (*Tysonian glands*).

The *sebaceous secretion* from these glands is a fluid or semi-fluid fat consisting of water, cast-off nucleated, granular, epithelial cells, fat globules, palmitin, olein, palmitic and oleic acids, saponified fat, a casein-like albuminoid, cholesterin, phosphates and chlorides. In the sebaceous matter is frequently found, microscopically, an acarus, or mite, the *demodex folliculorum*, which is usually considered to be harmless.

Hairs.—Hairs are short or long, rounded or cylindrical horny formations which are derived from the epidermis. Each hair is held in a pouch-like depression, the hair follicle, which runs obliquely through the epidermis into the corium; each follicle holds usually but a single hair. The curliness of the scalp hair apparently depends upon the amount of curve and depth of the hair follicle; hence, the hair follicle of the negro is of the greatest length and is markedly curved. It has been calculated that there are approximately 1000 hairs to the square inch upon the scalp; about 120,000 to the entire area. The light-haired individual possesses the greatest number of scalp hairs. Hairs are found on all portions of the cutaneous surface, with the exception of the palms, the soles, the dorsum of the last phalanges of the fingers and the toes, the glans penis, and on the inner surface of the prepuce.

A *hair* consists of the *hair shaft*, or that portion exterior to the skin, and the *hair root*, or that part which is contained in the hair follicle within the integument. The lower portion of the hair root expands into a club-shaped or spherical formation known as the *bulb;* the concavity of the bulb fits over the *papilla*, through which the nourishment of the hair is supplied. The hair is composed of a *cortex* or cortical substance which constitutes the bulk of the hair, the *medulla*, which lies in the medullary canal, and the *cuticle*, a thin membrane covering the hair.

The *hair follicle* is composed of several layers: The dermic, or external coat, the epidermic, or inner coat, and the root sheath proper of the hair.

The *dermic coat* is divided into three portions: An external longitudinal layer of fibrous tissue, a middle transverse layer and an internal homogeneous or vitreous layer.

The *epidermic coat* (outer root sheath of some authors; prickle-cell layer) is a continuation of the rete layer of the epidermis.

The *root sheath proper* (the internal root sheath of some writers) has two portions: An outer layer, or the sheath of Henle, and an

inner sheath of Huxley. These sheaths arise from the cylindrical cells covering the hair papilla.

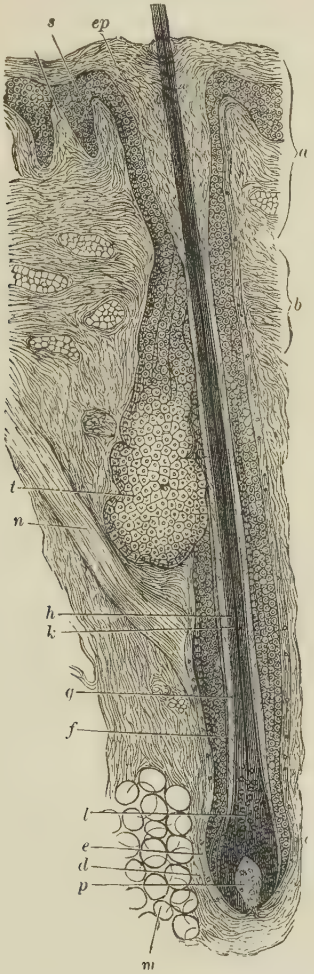


FIG. 8.—Hair follicle in longitudinal section: *a*, mouth of follicle; *b*, neck; *c*, bulb; *d*, *e*, dermic coat; *f*, outer root sheath; *g*, inner root sheath; *h*, hair; *k*, its medulla; *l*, hair knob; *m*, adipose tissue; *n*, hair muscle; *o*, papilla of skin; *p*, papilla of hair; *s*, rete mucosum, continuous with outer root sheath; *ep*, horny layer; *t*, sebaceous gland. (Ormsby.)

Nails.—The nails are horny, elastic, translucent, concavo-convex plates placed upon the dorsum of the distal phalanges of the fingers and the toes. The nails are divided into two portions:

The uncovered part, or the *nail body*, and the covered or imbedded part, or the *nail root*. The nail is embedded posteriorly and also somewhat laterally in a depression between the matrix and the overlying skin, which is known as the *nail groove*. This overlapping portion of skin is called the *nail fold* or nail wall.

The *nail bed* is the tissue upon which the nail lies, and is composed of the rete layer of the epidermis, the corium and the subcutaneous tissue. The nail grows from the posterior portion of the nail bed, which is designated the *matrix*. The two portions of the nail bed (nail couch) are separated by the *lunula*, which is a whitish crescent of a lesser translucency than the other portions of the nails. There is a gradual transformation, at the matrix, of the epithelial cells of the rete into those of a horny character, which results in the formation of the hard nail substance. The

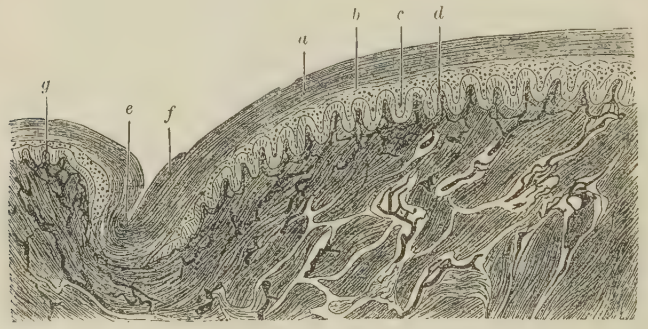


FIG. 9.—Vertical section of one-half of nail and matrix: *a*, nail substance; *b*, horny layer; *c*, mucous layer; *d*, papillæ of corium; *e*, nail furrow destitute of papillæ; *f*, horny layer of the ungual furrow rising above the nail; *g*, papillæ of skin of dorsal surface of the finger. (Ormsby.)

nail bed is highly vascularized. Accidental white spots, so-called *gift spots*, are not infrequently found in the nails, and are supposedly due to the presence of air between the lamellæ.

The nails grow more rapidly in summer than in winter. They require from one hundred and eight to one hundred and sixty-one days to grow from the lunula to the free edge of the fingers. (Berthold, Dufour.) The toe nails have a slower growth, requiring from one hundred and eighty to three hundred and sixty-five days for the same progression.

PHYSIOLOGY OF THE SKIN.

The skin has a complex structure and exercises several important functions, such as protection to the underlying structures,

tactile and thermal sensations, heat regulation, secretion and elimination.

The denseness of the epidermis, its oily coating and the elasticity of the underlying layers serve as a protection against the injurious effect of high and low temperature, antagonizing the action of caustic and poisonous liquids and other deleterious substances. The oily coating prevents too great an evaporation of water. The hairy covering of the scalp helps in protecting the brain against external injury.

The skin contains the delicate nerve mechanism through which tactile and thermal sensations are appreciated.

The integument is a poor conductor of heat because of its firm structure and oily coating. The vasomotor nerves have an important action in heat radiation; cold causing a reflex contraction of the capillaries, through the agency of the muscular fibers of the bloodvessels, decreasing the heat loss by a diminution of the surface blood supply and the vascularity of the sweat glands; heat producing an opposite effect. The arrectores pilorum muscles, because of their intimate relationship with the elastic tissue, assist, by their contraction, in driving the blood from the skin surface, and by causing an expulsion of the contents of the sebaceous glands; the reverse is true when these muscles expand.

The secretions of the sebaceous and sweat glands keep the skin lubricated and soft and the hairs oily and silky.

The excretory function of the integument is extremely important. Elimination takes place through the sweat glands and, to a slight degree, through the sebaceous excretions. Effete and noxious products are removed in this way from the body. It has been estimated that approximately two pounds of sweat are excreted in each twenty-four hours. Carbonic acid is also eliminated through the skin, according to Scherling, 10 gm. being given off every twenty-four hours. A large quantity of water is excreted through the skin. Both the carbonic acid and water are eliminated to a great extent by the sweat glands, although a small portion is probably given off by the capillaries of the papillæ.

SYMPTOMATOLOGY.

Objective Symptoms.—The fundamental basis of dermatology consists of the knowledge of the structure of the skin and the ability to recognize the lesions which attack the integument. It is absolutely essential, in order to make the correct diagnosis of a cutaneous eruption, to have a thorough understanding of the elementary or primary, the consecutive or secondary, lesions of the skin.

The elementary, or primary lesions, consist of macules, wheals, papules, tubercles, tumors, vesicles, blebs and pustules.

Maculæ (macules) are non-elevated circumscribed spots of various sizes, tints or shapes. The color can be pressed from those of the erythema group, while the tint cannot be eliminated by pressure from the hemorrhage of the skin.

Pomphi (wheals) are variously sized and shaped, transient, whitish, pinkish or reddish edematous elevations.

Papulæ (papules) are pin-head- to split-pea-sized, circumscribed solid elevations, of a white, yellow, pink or red color.

Tubercula (tubercules) are solid, usually circumscribed elevations, larger than a split pea in size.

Tumores (tumors) are soft or hard, usually more or less circumscribed deep-seated elevations.

Vesiculæ (vesicles) are whitish, yellowish, or reddish, pin-point to small pea-sized elevations, containing clear or opaque fluid, and having their seat in the epidermis.

Bullæ (blebs) are rounded or irregularly shaped, tense or flaccid, pea and larger sized elevations, containing clear or opaque fluid, and located in the epidermis.

Pustulæ (pustules) are pin-point or larger sized circumscribed epidermic elevations containing pus. They differ from vesicles and bullæ only in their contents.

The secondary lesions consist of scales, crusts, excoriations, fissures, ulcers, scars and stains.

Squamæ (scales) are dry, usually laminated, exfoliations of the epidermis, resulting from some morbid process in the skin.

Crustæ (crusts) are irregular masses of dried exudation, usually mixed with more or less epithelial débris.

Excoriationes (excoriations) are epidermal denudations, irregular or linear in formation, usually superficial in type, and caused by local traumatism, such as scratching.

Rhagades (fissures) are linear cracks in the skin, which may be superficial or deep, and are the result of injury or disease.

Ulcera (ulcers) are round or irregularly shaped and sized losses of cutaneous tissue, resulting from a previous pathological process involving the corium or subcutaneous tissue.

Cicatrices (scars) are connective-tissue new formations, which replace that portion of the corium or subcutaneous tissue which has been destroyed by disease or injury.

Pigmentationes (stains) are the discolorations of the skin that remain after the disappearance of certain cutaneous lesions.

Subjective Symptoms.—Subjective symptoms consist of the sensation of burning, heat, tingling, prickling, stinging, formication, itching and pain. Subjective phenomena are experienced chiefly

in the inflammatory eruptions. Tenderness and pain are chiefly complained of in phlegmonous outbreaks and in malignant neoplasms.

The personal element enters to a considerable extent in these sensations. A neurotic individual may complain bitterly of itching, burning or pain, while the stoical nature experiences these subjective phenomena far less than the patient of the average type. Race determines somewhat as to sensation: For instance, the syphilitic eruption not infrequently itches in the negro, while pruritus is almost invariably absent in this disease in the white race. Age also may govern these sensations to a slight degree, a child frequently having very little pain in herpes zoster (shingles) while the adult may suffer intensely.

ETIOLOGY.

Many skin diseases are unfortunately of unknown origin. Etiological factors, however, owing to the intensive study of numerous investigators, are being determined in an increasing number of dermatological conditions.

Heredity.—Certain abnormalities may be observed either at birth or become manifest very shortly afterward, and are termed congenital or hereditary. Birth-marks, so-called "mother's marks," and moles are of rather frequent occurrence. Two other conditions may be present—one, rarely seen, in which there is a defect in the elastic tissue (epidermolysis bullosa), and the other showing a derangement of the horn production and lubrication of the skin (fish-skin disease, ichthyosis) is more frequently observed. Syphilis, of a generalized character, appearing a few weeks after the birth of the infant, should be placed in this classification. The negro race shows a tendency to an overgrowth of fibrous tissue (keloid) at the point of an injury.

Age.—In the first few weeks of life the generalized eruption of congenital (hereditary) syphilis is observed. Certain diseases are prone to develop under the age of puberty, usually at quite an early period, such as the "diaper eruption" of infants, the exanthemata, impetigo contagiosa, eczema, particularly of the face and the scalp, papular urticaria (lichen urticatus), ringworm of the scalp and lupus vulgaris (tuberculosis of the skin).

Sex.—Females are attacked by cancer of the nipple (Paget's disease), and this sex shows more frequently the mild type of acne rosacea and the lesions of erythematous lupus. Males are more often attacked by the severe type of acne rosacea, the various occupational dermatoses, sycosis vulgaris, tinea sycosis (ringworm of the beard) and cancer of the skin.

Season.—Certain affections are frequently observed during the cold weather, such as psoriasis, of a more severe type, winter pruritus and dryness and scaliness of the skin (ichthyosis). Miliaria (prickly heat) is a disease of warm weather. Erythema multiforme is of more frequent occurrence in the spring or autumn.

Race.—Some diseases are prone to occur among certain races or in certain climates. Prurigo, as an example, is common in Austria and is rarely seen in our country. Favus is usually seen among Italians, Germans or Russians. Kaposi's sarcoma is a rare condition most frequently found in the Hebrews. Tuberculosis of the skin (lupus vulgaris) is much more prevalent on the Continent of Europe than here.

In the Tropics are observed leprosy, yaws, oriental sore and numerous fungus infections of the skin, such as "dhobie itch, tinea imbricata," etc. These cutaneous outbreaks should be remembered in diagnosing eruptions in those coming from tropical countries.

External Causes.—Irritants giving rise to an outbreak on the skin may be grouped under the following headings: Traumatic, thermal, chemical, mechanical, plants, drugs, animal parasites and vegetable organisms. These various factors are mentioned under Dermatitis and the Animal and Vegetable Parasitic Diseases. Emphasis should be made, however, of the tremendous importance of the dermatitis due to the irritants handled in trades and in every-day life. Dermatitis of the neck can be increasingly attributed to the fur piece. The large number of cosmetics in use and the many preparations, including dyes, used on the scalp, are a prolific source of skin eruptions. Woolen underclothing and neck pieces may cause itching and an inflammation of tender and rather dry skins.

Microscopical study of scales and crusts from lesions on the skin is decreasing the field of dermatological conditions of unknown origin. Vegetable organisms of the fungi and bacterial groups are being proved to be of the greatest etiological importance.

Internal Causes.—The organs of eliminations, the kidneys and the gastro-intestinal tract, particularly the latter, are undoubtedly associated with the cutaneous outbreaks, chiefly urticaria, eczema and the toxic forms of dermatitis and drug eruptions. The nervous system, the heart and bloodvessels, the utero-ovarian apparatus, and the ductless glands all have an influence in certain cutaneous outbreaks. Focal infection from the teeth and tonsils are undoubtedly the source of certain toxic outbreaks. It behooves us all, however, to be conservative and not to needlessly subject our patients to unnecessary mutilation.

Foods are a prolific source of cutaneous eruption. Personal susceptibility to various articles of diet should always be remembered.

Certain individuals cannot take eggs, milk or possibly one or several of the usually ingested articles of diet. Many cannot take shell-fish, nuts, oatmeal, etc. Urticaria, toxic erythema, angioneurotic edema or eczema may be the result of this idiosyncrasy. This food-protein sensitization is becoming of extreme importance and the elimination of one or several articles from the diet occasionally brings a rapid and complete disappearance of an extensive and frequently recurring or chronic eruption.

PATHOLOGY.

According to MacLeod, the reaction of the various layers of the skin depends upon the reaction of the blood and the lymph, on the one hand, and upon that of the sweat, on the other. Heuss, in his investigations upon the reaction of the sweat, has proved that in health it is acid, but that in excessive sweating it loses much of its acidity and may at times become alkaline. The acidity of the sweat is dependent upon the presence in it of carbonic acid and certain organic acids, such as acetic and butyric.

On account of the acidity of the sweat, the reaction of the epidermis, both on the surface and in the Malpighian layer, is generally acid, and the intensity of the acidity varies in different regions in proportion to the number of sweat glands.

The reaction of the sweat influences the epidermis to a greater degree than the corium, because the sweat duct really ends at the epidermis, and the channel, through the latter to the surface, is an unlined winding passage between the epidermal cells, which freely communicates with the lymphatic spaces between the neighboring cells.

The corium and its fibrous elements are faintly alkaline in reaction because it mainly depends upon the blood and lymph.

The white fibrous bundles and the elastic fibers are both alkaline in reaction, and, in consequence, attract acid dyes (acidophilic); the elastic fibers have a peculiarly strong affinity for acid dyes. The nuclei of cells, whether of the epidermis or corium, are more acid in reaction than the remainder of the cell; hence, the nuclei and their chromatin are basophilic while the hyaloplasm and spongioplasm of the cells are acidophilic.

It is important to recognize these differences in reaction of the elements in health, because, pathologically, these reactions become altered. As a prelude to disintegration, for instance, the fibrous elements generally lose their acidophilic characters and begin to attract basic dyes; degenerative products, such as hyalin, may appear in the protoplasm of the cells, which are more intensely acidophilic than the protoplasm itself.

The epidermis[1] may undergo hypertrophy either as a whole or in some of its component layers. Hypertrophy of the stratum corneum or horny layer, designated hyperkeratosis, is a common pathological condition. It may be a congenital and generalized affection, as in ichthyosis, or it may be acquired and limited to circumscribed areas, as in callosities and cutaneous horns. There is not only a more or less marked increase in the number of the horny cells, but they have undergone a qualitative alteration; owing to an increase in the keratin, they are firmer than normal and have lost to some extent their cohesiveness, so that they may be easily separated. Circumscribed hyperkeratoses are extremely common lesions, and result from a variety of causes. Lesions of this kind are frequently seen upon the palms and upon the soles, in the former as the result of pressure from the use of certain tools, and in the latter from ill-fitting shoes. They may result from ingestion of certain drugs, such as arsenic, which produces peculiar, corn-like lesions upon the palms and soles, and from senile change in the skin, as in so-called senile keratosis. It is an interesting and important fact that epithelioma is prone to follow certain circumscribed hyperkeratoses, especially those following the prolonged use of arsenic and the senile form. Hyperkeratosis may exist alone or be associated with other morbid conditions.

In a number of affections of the skin, chiefly inflammatory in character, horn production takes place imperfectly. The nuclei of the horny cells do not completely disappear, as under normal conditions; there is an absence of keratohyalin granules and a diminution of cohesion between the cells, so that desquamation readily takes place and small collections of leukocytes are frequently present between the cells. This condition, which is known as parakeratosis, is always preceded by pathological alterations in the rete mucosum and is observed in eczema, psoriasis and some other affections, with desquamation or scaling. Hypertrophy of the rete mucosum, acanthosis, occurs both as a benign and a malignant process. In the former, while the cells are increased in number, they will retain the ordinary characteristics of the cells of this layer, but in the latter the overgrowth is accompanied by alterations in the cells themselves; they lose their intercellular fibrils so that they are no longer connected with one another; they become smaller and round or oval instead of polygonal, and undergo various forms of degeneration with frequent cell inclusions. In malignant overgrowth of the rete, the columnar basal layer of cells no longer forms a sharp dividing boundary between the epidermis and the corium, but is invaded and broken up by the multiplying altered cells from above and by leukocytes from the corium below.

[1] This pathological description has been largely borrowed from Hartzell (Diseases of the Skin, 2d ed., p. 29).

Atrophy of the rete mucosum may occur as the result of pressure from within or without. It may occur as an idiopathic affection associated with atrophy of other parts of the skin, and is frequently the result of advancing years, when it is known as senile atrophy. The thickness of the layers of epithelial cells is diminished sometimes greatly, and the interpapillary prolongations are markedly shortened so that the undulatory boundary between it and the corium approaches a straight line.

In a large number of inflammatory conditions of the skin, such as eczema, herpes and the various forms of dermatitis arising from contact with chemical substances and plants, edema of the retè mucosum takes place, which, when considerable, frequently leads to the formation of lesions peculiar to the skin and mucous membranes known as vesicles. This edema may be either intercellular, intracellular or both.

The situation of vesicles varies considerably. They may be immediately beneath the horny layer of the epidermis or anywhere between the horny layer and the papillary layer of the corium.

Bullæ, or blebs, may be regarded as exaggerated vesicles, since the mechanism of their production is practically the same as that of the latter. In the bullæ of pemphigus and of dermatitis herpetiformis many eosinophiles are commonly present.

Pustules differ but little, if at all, in their structure, from vesicles. Indeed, a vesicular stage often precedes the pustules, the fluid contents being clear or only slightly turbid at first, becoming purulent later.

In inflammatory conditions of the skin, the corium shows a dilatation of the bloodvessels, with exudation of plasma and leukocytes. The cellular exudate is usually most abundant in the neighborhood of the vessels, the hair follicles and the sweat glands. It is composed of polymorphonuclear and small mononuclear cells, some of which are lymphocytes and others are probably derivatives of the connective-tissue cells, although there is considerable difference of opinion concerning the nature and the origin of the small, round mononuclear cells.

Other types of cells are present in certain diseases which have more or less special significance. One of the most important of these, present especially in chronic inflammation, in infective granulomata and certain malignant affections, is the plasma cell. This is a large, round, frequently cuboidal cell with a large, round or oval nucleus eccentrically situated.

A more or less considerable increase in the number of "mastzellen" occurs in a number of diseases of the skin. These, which are normally present in small numbers in the corium, are large,

round, oval, spindle-shaped and frequently branched cells, in the protoplasm of which are numerous basophilic granules.

Giant cells of the Langerhans type are met with in the corium in the various forms of tuberculosis of the skin so constantly as to be a characteristic feature of this affection.

They may, however, be found, much less frequently in syphilis, lepra and blastomycosis. Chorio-plaques, which are giant cells with centrally placed nuclei, are found in lepra and yaws.

The fibrous elements of the corium, the collagen, may undergo diffuse hypertrophy, but more or less atrophy takes place in many diseases.

Both the cellular and fibrous elements of the corium may undergo various forms of degeneration, such as fatty, hyaline, colloid and myxomatous, which do not differ essentially from those occurring in other tissues.

In many diseases of the skin, the fibrous and elastic elements, the collagen and elastin, undergo degeneration, which causes them to lose their normal affinity for acid dyes and to become basophilic; the collagen is transformed into collacin and collastin, the elastin into elactin.

The pigment of the skin is of two varieties: An iron-containing one, always pathological, composed of yellow crystalline granules, hematoidin, and dark amorphous granules, hemosiderin; and an iron-free pigment, melanin, which exists normally in the skin in certain regions. Pigmentation from deposit of hematoidin and hemosiderin in the tissues follows extravasation of blood, such as occurs in purpura and after contusions, when it is usually of short duration. It also occurs as a sequel of long-standing inflammations accompanied by venous stasis, such as chronic eczema of the lower extremities, especially when associated with varicose veins, when it is apt to be permanent or of long duration. A more or less general pigmentation of the skin, due to hemosiderin, occurs in bronze diabetes (hemochromatosis).

DIAGNOSIS.

The physician, after having made a thorough examination of the skin, should be certain as to the character of the eruption that is present. If the predominating lesion is even with the skin surface, it is a macule; if slightly elevated and without a fluid contents, it is a papule. If it contains clear fluid, it is a vesicle, but if the contents of the elevated lesion is pus, the designation pustule is given. It should be emphasized that developing after the so-called dry lesions, in other words, macules and papules, there may be a scale. The oozing which follows the breaking of

moist lesions (vesicles or pustules) gives rise to a crust. The observer should also be certain as to whether there is more than one type of lesion present. In certain diseases of the skin, for instance, there is what we call a multiform eruption. A multiform eruption consists of several types of lesions. When a conclusion has been reached as to the predominating type or types of lesions which are present, study the arrangement of the outbreak. If the lesions are separate and distinct from each other, they are called discrete; if arranged close together, but not actually touching one another, the term of grouped is used. If the lesions run together to form a confluent area of involvement, it is spoken of as a patch. Palpate these areas and be certain if the color is removed under pressure with either a macular or papular outbreak. If temporarily removed by pressure, it shows that there is simply a congestion (hyperemia), if only partially removed, mild inflammatory changes are present. If pressure produces no change in the lesions, it proves that there is a hemorrhage.

There should be no difficulty in making the diagnosis of the common diseases of the skin if the observer is certain of the predominating lesions, whether but one type of lesion is present or several varieties of outbreak; the distribution and the various characteristics of discreteness; tendency to group or form patches, the presence or absence of itching; localization or generalization of the eruption and whether there is an ulcerative tendency.

It will be of help to the student and general practitioner, in making the diagnosis of a skin condition, to consult the following tables:

TYPES OF LESIONS FOUND IN THE COMMON DISEASES OF THE SKIN.

Macular Eruptions.

Toxic Erythema.—Red or pinkish color of the skin; if localized, probably due to external cause; if generalized, frequently of internal origin, such as derangement of the gastro-intestinal tract, ingestion of drugs or antitoxin.

Erythema Multiforme. Pea or larger sized lesions on the backs of the hands and feet and sides of the neck, with no scale formation.

Syphilis.—Generalized, including palms, soles and mucous membranes; tendency to become papular.

Dermatitis, or Eczema.—Reddish patches, fading away into the sound skin, with a yellowish scale on the surface; attacks chiefly the hands, forearms, neck and face.

Papular Eruptions.

Lichen Planus.—Papules, pin-head to pea in size, with a flat shiny top of a violet or purple color, and intensely itchy. They are located on the flexure surfaces of the lower arms and lower legs, and may become rather generalized, with the exception of the face and scalp.

Eczema.—Reddish, scaly papules, with a rounded or pointed surface tendency to form patches, any location, localized or generalized, with intense itching.

Psoriasis.—Reddish, sharply marginated patches, mostly dime or larger in size, with a silvery-white scale on the surface, particularly on the elbows, knees and scalp.

Syphilis.—Generalized eruption, with a yellowish-brown scale on the surface of dark red lesions, large pea to dime in size; macules, and sometimes pustules, are present; palms, soles, genital region and mucous membranes are involved; itching is usually absent.

Seborrheic Dermatitis.—Reddish, rather marginated patches, with a greasy yellow scale, involving areas of hair, heat and moisture.

Pityriasis Rosea.—Dime to quarter-dollar sized, extremely superficial, pinkish lesions, with a fawn-colored scale, involving the trunk and upper portion of the extremities.

Tinea Versicolor.—Yellowish-brown, pin-head to pea size, slightly scaly lesions, chiefly observed on the chest and upper back.

Ringworm.—Marginated, red patch; elevated circumference, yellowish scale on the center, approximately one-half dollar in size; one, two or three present; face, neck, hands and lower arms usually; more frequently seen in children.

Vesicular Type.

Herpes Zoster.—Goups of vesicles on a red base, following the course of a cutaneous nerve; always unilaterally distributed, usually below the rib margin.

Herpes Simplex (*Fever Blister*).—Groups of vesicles on or near the lips.

Dermatitis Venenata (*Plant Poisoning*).—Groups of vesicles, pin-head to small pea in size, arranged in a line; observed particularly upon the hands, fingers, face and genital region; spring and summer months chiefly; intense itching.

Chicken-pox.—Discrete, pea-sized vesicles; some on a red base and more on the trunk and extremities than the exposed parts; chiefly in childhood.

Eczema.—Reddish patches fading away into the sound skin, with pin-head and smaller sized vesicles, oozing and crusting, intense itching, exposed parts chiefly.

Pustular Type.

Impetigo Contagiosa.—Discrete lesions, starting as vesicles and becoming pustules, forming yellowish, dime- and smaller-sized. crusts; face and scalp chiefly; childhood more frequently attacked.

Sycosis Vulgaris.—Pustules, each pierced by a hair; limited to the bearded region and mustache area of the male adult; no hair loss.

Ringworm of the Beard.—Pustules, fluctuating abscess-like lesions, soft tumor-like masses, partial or complete hair loss in diseased areas, limited to the bearded region of the male adult.

Eczema or Dermatitis.—Pustular lesions, crusting, oozing; located on a red patch; intense itching, particularly the face and scalp of children.

Drug Eruptions.—The bromides and iodides not infrequently give rise to pustular lesions scattered over the face and trunk.

Diseases Showing a Multiform Eruption.

Acne Vulgaris.—Papules, pustules, blackheads and, occasionally, sebaceous cysts observed particularly on the face, shoulders and back.

Acne Rosacea.—Papules, a few pustules and dilated capillaries, particularly on the central portion of the face.

Scabies.—Papules, pustules, vesicles and the diagnostic "burrow"; generalized, excepting the face; intense itching at night.

Pediculosis Corporis.—Punctate hemorrhages and long linear scratch marks; face, hands and feet free; itching chiefly at night.

Eczema.—Macules, papules, vesicles and pustules, scales and crusts, located on a red base, fading away in the sound skin with intense itching; localized or generalized.

Syphilis.—Macules, papules, pustules or a combination of these lesions; generalized, including palms, soles, genital region and mucous membrane; no itching.

Eruptions Showing a Scale Formation but no Redness.

Ichthyosis (*Fish-skin Disease*).—This disease may be generalized; usually, however, in the milder cases it is limited to the extensor surfaces. There is roughness and scaliness, but no redness.

Seborrhea.—Scaliness, with no redness; limited to the scalp.

Diseases Causing Scar Formation.

Tuberculosis.—Tuberculosis of the skin produces ulceration, followed by scarring.

Syphilis.—Syphilis in a late stage shows ulceration of a kidney shape, with scars showing the same characteristic.

Epithelioma.—Epithelioma produces ulceration with scar formation.

Scars may also be observed following varicose ulcers, traumatism, smallpox, the pustular type of syphilis, various pyogenic infections, ecthyma, deep-seated inflammatory ringworm, etc.

REGIONAL DISTRIBUTION OF THE COMMON SKIN DISEASES.

Scalp: Dry Lesions.

(*a*) Red, sharply marginated, thick patches, with a silvery-white scale; little or no itching; particularly young adults—*psoriasis*.

(*b*) Red, rather marginated, moderately thick patches, with a greasy yellow scale; moderate itching—*seborrheic dermatitis*.

(*c*) Reddish patches, fading away into the sound skin, with a dry yellow scale and severe itching—*eczema* or *dermatitis*.

(*d*) Diffuse, scaly areas, without redness, and no patchy hair loss—*seborrhea*.

(*e*) Scaly areas without redness; incomplete hair loss in spots, broken-off hairs, prominence of hair follicles; in children—*ringworm*.

(*f*) Total hair loss in spots; no redness or scale formation; adults chiefly—*alopecia areata*.

Scalp: Moist Lesions.

(*a*) Separate and distinct vesicles, becoming pustular with secondary crusting and frequently associated with lice—*impetigo contagiosa*.

(*b*) Vesicles and pustules on a red patch with crusting—*eczema* or *dermatitis*.

Face: Dry Lesions.

(*a*) Red patches fading away into the sound skin; yellowish scale on the surface; any portion of the face—*eczema* or *dermatitis*.

(*b*) Red patches, rather marginated; hairy portions; greasy, yellow scales—*seborrheic dermatitis*.

(*c*) Symmetrical eruption on cheeks and nose, marginated; reddish patches, with enlarged "pores"; slight scale—*erythematous lupus*.

(*d*) Reddish patches, sharply marginated; silvery-white scales; on forehead, in contact with scalp—*psoriasis*.

(*e*) Single, two or three quarter-dollar sized, marginated, red-

dish, scaly lesions; elevated border; any part of face; in children chiefly—*ringworm.*

(*f*) Total hair loss in spots; no redness or scale formation; bearded region chiefly; male adults—*alopecia areata.*

Face: Moist Lesions.

(*a*) Vesicles or pustules, or both, with crusting, on a red base, which fades away into the sound skin; any portion of the face; intense itching—*eczema* or *dermatitis.*

(*b*) Separate and distinct vesicles, becoming pustules, with secondary crusting; any part of the face; chiefly children—*impetigo contagiosa.*

(*c*) Pustules, separate and distinct, each pierced by a hair; bearded region and mustache area; adult male—*sycosis vulgaris.*

(*d*) Pustules; abscess-like lesions; crusting; partial or complete hair loss in areas; bearded region in adult male—*ringworm.*

Face: Multiple Lesions and New Growths.

(*a*) Papules, pustules, blackheads and sebaceous cysts involving any portion of the face; patient, fifteen to twenty-five years of age—*acne vulgaris.*

(*b*) Papules, a few pustules, no blackheads or sebaceous cysts, dilated capillaries; nose, cheeks and forehead chiefly; after twenty-five years of age—*acne rosacea.*

(*c*) Deep-seated, reddish-brown papules and nodules, forming patches; slow in growth; tendency to ulcerate; starts in childhood—*lupus vulgaris* (tuberculosis of the skin).

(*d*) Papules, nodules and gummas, grouped in form of segment of circle; kidney-shaped ulceration; middle life—*late stage of syphilis.*

(*e*) Single, nodular growth; tendency to ulcerate, developing on preceding lesion; history of injury; after forty years of age—*cancer.*

Neck.

(*a*) Enlarged posterior cervical glands are observed, chiefly secondary to *lice in the scalp,* in children; in *German measles* and in *secondary (generalized) syphilis.*

(*b*) *Dermatitis,* due to fur or other irritating articles or preparations.

(*c*) *Ringworm.*

(*d*) *Boils,* chiefly on the posterior surface.

Trunk.

(*a*) Marginated, superficial pinkish-red, slightly scaly, dime to quarter-dollar sized patches; limited to trunk and upper part of extremities; runs course of one to two months—*pityriasis rosea*.

(*b*) Reddish, thickened patches; silvery-white scales; dime to silver dollar and larger in size; also on extensor surface of extremities and scalp—*psoriasis*.

(*c*) Rather marginated, reddish eruption; greasy-yellow scales; over sternum, between shoulders, axillæ, pubic region, also on hairy portions of face and scalp—*seborrheic dermatitis*.

(*d*) Reddish patches fading away into the sound skin, with a scale, if outbreak is dry, or with a crust, if outbreak consists of vesicles and pustules, involving any or all portions of the trunk, associated with intense itching—*eczema* or *dermatitis*.

(*e*) Yellowish-brown, scaly, pin-head to pea-sized, slightly elevated lesions, tending to form patches, chiefly on the chest and upper back—*tinea versicolor*.

(*f*) Reddish patches; yellowish scale; sharply marginated elevated border; pubic region, inner surface of upper thighs, axillæ; male adult chiefly—*ringworm*.

(*g*) Groups of vesicles; below the margin of the ribs, always on one side; associated with a considerable amount of pain—*herpes zoster* (shingles).

Genital Region.

(*a*) Dime-sized, smaller or larger, indurated lesion—*chancre*.

(*b*) Group of vesicles—*herpes simplex* (cold sore, fever blisters).

(*c*) Pustules on the penis—*scabies*.

Arms.

(*a*) Sharply marginated, thick, reddish patches, with silver-white scales on the elbows—*psoriasis*.

(*b*) Rather marginated, reddish patches; greasy-yellow scales; bends of arms—*seborrheic eczema*.

(*c*) Reddish patches, fading away into the sound skin, with yellowish scales or with a crust if outbreak consists of vesicles or pustules; any portion of the arms—*eczema* or *dermatitis*.

(*d*) Flat, pin-head sized, violet colored, shiny, slightly scaly papules on the flexure surface of the lower arms—*lichen planus*.

(*e*) Flat, reddish, dime- and smaller-sized papules, with no scale, from which most of the color can be pressed; symmetrical on extensor surface of both lower arms—*erythema multiforme*.

Hands.

(*a*) Reddish eruption, fading away into the sound skin, with a scale on the surface or with a crust if the outbreak consists of vesicles or pustules—*eczema* or *dermatitis*.

(*b*) Flat, pea to dime-sized, reddish-brown, scaly papules on both palms—*secondary syphilis*.

(*c*) Yellowish discoloration, roughness and warty lesions on both palms—*arsenical keratosis*.

(*d*) Kidney-shaped nodules, with a scale and ulceration, involving one palm—*late syphilis*.

(*e*) Flat, reddish, dime and smaller-sized papules; no scale; backs of hands—*erythema multiforme*.

(*f*) Separate pustules and vesicles on the lateral aspects and webs of fingers and flexure surface of wrists—*scabies*.

(*g*) Red, scaly, sharply marginated patches; yellowish scale—*ringworm*.

Legs.

(*a*) Red, marginated, thick patches; silver-white scales on the knees—*psoriasis*.

(*b*) Red, rather marginated patches with greasy-yellow scales; popliteal spaces—*seborrheic dermatitis*.

(*c*) Red patches, fading away into the sound skin, with yellowish scales on the surface, or vesicles and pustules with crusting—*eczema* or *dermatitis*.

Feet.

(*a*) Red patches, fading away into the sound skin, with yellowish scales, or vesicles and pustules with crusting—*eczema* or *dermatitis*.

(*b*) Red, marginated patch, with a yellow scale—*ringworm*.

(*c*) Flat, dime or smaller sized, reddish-brown, scaly papules on the soles of the feet—*secondary* (*generalized*) *syphilis*.

(*d*) Yellowish discoloration; roughness and warty lesions on both soles—*arsenical keratosis*.

(*e*) Kidney-shaped nodules, with scale and ulceration; sole of one foot—*late stage of syphilis*.

Generalized Eruptions with Itching.

(*a*) *Eczema* or *dermatitis* may attack any or all portions of the skin, with a tendency for the lesions to run together and form patches, reddish in color and fading away into the sound skin, with a yellowish scale, or with vesicles, pustules and crusting; itching day and night.

(*b*) *Scabies* involves all portions of the body, excepting the face and scalp; chiefly the flexure surface of the extremities, hands, fingers and anterior surface of the trunk, genital region and breasts; separate and distinct multiform lesions; itching only at night.

(*c*) *Pediculosis corporis* attacks all portions of the body, excepting face, scalp, hands and feet; chiefly the extensor surface of the extremities and the posterior surface of the trunk, and is characterized by long linear scratch marks and punctate hemorrhages; itching only at night.

(*d*) *Urticaria* (hives).

GENERALIZED ITCHING WITH NO ERUPTION.

Pruritus.

GENERALIZED ERUPTION WITH NO ITCHING.

Syphilis (secondary stage).

SPECIAL METHODS OF DIAGNOSIS.

Microscopical Examination.—The use of the microscope is of extreme importance in making or confirming a diagnosis of a cutaneous condition. It is easy to scrape a few scales from a lesion on the skin surface and place them in a drop of liquor potassa on a glass slide for microscopical examination. The finding of rounded or oval, shiny bodies shows the presence of ringworm fungus. Examination for other microörganisms helps greatly in determination of the proper treatment. Dark-field examination for the Spirocheta pallida (Treponema pallidum) means the early treatment of syphilis at the onset of the disease. Portions of obscure lesions should always be excised and carefully examined so that the patient may profit by modern methods of diagnosis.

The Wassermann and luetin tests will be described under Syphilis. The tuberculin tests will be given in detail under Tuberculosis of the Skin.

Skin Tests.[1] –It is common knowledge now that proteins, in the nature of foodstuffs and focal infections, are the cause of a fair number of cases of urticaria, angioneurotic edema and eczema and that chemicals, like arsenic, quinine, cocaine and others, may be responsible in some cases of dermatitis. The phenomenon of hypersensitiveness offers an explanation of this particular relationship of proteins or chemicals to aforementioned dermatological affections.

[1] Indebtedness is acknowledged to my associate, Dr. David Sidlick, for assistance in the preparation of this section.

Definition.—Hypersensitiveness may be defined, clinically, as that state of an individual that whenever exposed to or inoculated with a given substance, which is harmless to the majority of human beings, that individual reacts in a characteristic manner.

The phenomenon of hypersensitiveness is classified into two groups: To one group, the term of anaphylaxis is applied, and for the second group the term of allergy is reserved. Anaphylaxis is the result of the prompt interaction of anaphylactogens and specific antibodies in a sensitized individual and, clinically, anaphylaxis manifests itself by dyspnea, tachycardia, generalized erythema, pruritus, urticaria, loss of control of sphincters, recovery or death. Allergy simulates, clinically, anaphylaxis, but differs from the latter in that the phenomenon does not depend upon the interaction of antigen in antibody. Local symptoms are the rule in allergy.

Sensitization, although it may be attributed to proteins, toxins, pollens or chemicals, but since no specific antibodies are demonstrable in the blood of these patients, it is grouped under allergy.

The Technic.—The essential cause of a dermatosis, where a protein or chemical is suspected, is ascertained by one of two ways: One method, known as the cutaneous test, is to make a number of scarifications, not deep enough to draw blood, and each about $\frac{1}{4}$ inch long and $\frac{1}{2}$ inch apart, upon the external surface of the arm. On each scarification is placed a small amount of different test substances. One or 2 drops of tenth-normal sodium hydroxide or normal sodium chloride solution is added to dissolve the protein and to facilitate its absorption. The second method is known as the intradermal test. The desired test substance is dissolved in sterile normal salt solution and 0.05 cc is then measured out with an accurate syringe and injected between the layers of the skin. A successful injection is followed immediately by the appearance at the site of the injection, of a raised white spot, resembling a wheal. More than one control is desirable. The intensity of the controls themselves may vary, depending upon the degree of irritability of the skin at different ridges. In the cutaneous test the control consists of tenth-normal sodium hydroxide or normal sodium chloride solution. In the intradermal test, the menstruum serves as the control.

Reading the Tests.—The local reaction in cutaneous tests is comparatively immediate. In the intradermal tests, the local reaction is delayed from twenty-four to forty-eight hours. The appearance necessary to establish a positive immediate test are a wheal, which appears from fifteen to thirty minutes, and an irregular red areola surrounding the wheal. The criteria for delayed positive tests are a papular induration and an erythema

persisting from twenty-four to forty-eight hours. The intensity of the reaction is determined by reading the tests against controls. If the wheal or papule equals the control and presents no erythema, it is negative; if it is half again as large and surrounded by erythema, it is +; if twice as large, ++; if three times as large, it is +++, etc. To be of value, the test must be ++ or greater in intensity.

Non-specific Reactions.—More than one reaction may be observed in the same patient. Also reaction to substances to which the patient has not been sensitized is occasionally possible. These inconsistencies are more apparent than real. The specificity of the reaction depends upon the chemical structure rather than the biological relation of various test substances.

Treatment.—The treatment of patients who give a positive skin test to food proteins is to omit such foods from the patient's diet for a number of weeks. The attempt to desensitize such patients against an offending protein, by injecting subcutaneously, gradually increasing amounts of the protein, have not proven successful. A patient with multiple skin reactions may be treated by prescribing 0.5 gr. of peptone three times a day before meals. Patients who react to bacterial proteins are treated with vaccines. The initial dose is 0.1 cc, the vaccine containing 1,000,000 bacteria to each 1 cc and increasing the dose by 0.1 cc every seventh day.

TREATMENT.

Although the indications in most, or at least a great many, cutaneous diseases is exclusively for external medication, a careful examination should be made to ascertain, if any of the internal organs, particularly those with an excretory function, are deranged, and, therefore, acting, particularly in extensive eruptions, as contributory factors in prolonging the outbreak or increasing its severity. The internal treatment is, to a great extent, symptomatic.

Diet is frequently of importance in the fairly generalized and inflammatory outbreaks of the skin and in such localized eruptions as acne vulgaris and furunculosis. Fried, greasy or highly seasoned foods, pie, cake, candy, pastry, tea, coffee and alcoholic beverages should be eliminated.

Internal Treatment.—Laxatives and Diuretics.—These preparations are frequently of use, because of their eliminative properties. Magnesium sulphate or sodium phosphate are efficient in their action. Russian oil, or its American substitute, acts as an intestinal lubricant and is a fairly dependable laxative. Cascara, in one of its various forms, answers the purpose admirably. Senna

leaves frequently suffices in those constipated individuals requiring daily medication.

A mild laxative pill, 3 gr. of phenolphthalein, taken each night, is both pleasant and efficient. A mild laxative, which is also somewhat antiseptic, consists of: Sodium hyposulphite, ½ oz. (15.); glycerin and peppermint water (each), 3 fl. oz. (90.); 2 teaspoonfuls to a quarter of a glass of water after each meal is recommended (Hartzell). The disagreeable, but efficient, mixture known as "mistura ferri acida," consisting of 1 oz. (30.) of magnesium sulphate; 4 to 8 gr. (0.25 to 0.5) of iron sulphate; 1 to 2 dr. (4. to 8.) of dilute sulphuric acid; and peppermint water to make 4 fl. oz. (120.) is given in tablespoonful doses, in half a glass of water, an hour before breakfast.

Alkaline diuretics, such as sodium citrate and sodium acetate, frequently assist in elimination in inflammatory outbreaks.

Gastro-intestinal Mixtures.—Various intestinal antiseptics have been largely used in dermatological conditions. Fermentation has been prevented, to a certain degree, by such well-known drugs as salol, ichthyol, betanapthol and resorcin. Various preparations have also been used to change or increase the acid reaction of the intestines, such as cultures of the lactic acid bacillus, the so-called "Bulgarian bacillus." In many instances, however, cleaning out of the intestinal tract, in other words elimination, is of greater help in a cutaneous outbreak than antiseptic preparations.

The gastro-intestinal mixtures most frequently employed by us are salicylate of soda, 2 dr. (8.); tincture of nux vomica, ½ fl. oz. (15.); fluidextract of cascara sagrada, 2 to 3 fl. dr. (8. to 12.); compound tincture of cardamom, 3 fl. oz. (90.), given in teaspoonful doses, twenty minutes before each meal, in those cases with intestinal putrefaction, constipation and lack of tone of the intestinal tract. In patients with eructations of gas, the bicarbonate of soda, 2 to 4 dr. (8. to 16.), is added to the above combination and the salicylate of soda omitted. If there is hypoacidity, lack of ability to digest the food and some lack of tone, the following is usually given: Acid, nitrohydrochloric, 1½ fl. dr. (6.); sulphate of strychnine, 1 gr. (0.06); essence of pepsin and compound tincture of gentian (each), 4 fl. oz. (120.); 2 teaspoonfuls in a quarter of a glass of water after each meal.

Tonics.—The various preparations of iron are frequently of use in anemic subjects with cutaneous outbreaks and those debilitated from a long-continued eruption.

Quinine is useful in those showing a malarial infection associated with an outbreak. Certain cases of pemphigus, dermatitis herpetiformis, erythematous lupus and exfoliative dermatitis are helped by this medication.

Strychnine, or nux vomica, may prove helpful in those physically below *par*, and who are suffering with various cutaneous outbreaks, such as acne vulgaris.

Cod-liver oil is of great assistance in curing cases of pustular eczema associated with enlargement of the lymphatic glands. It also should be given in the cachectic form of acne, in which sluggish, deep-seated lesions are present, in individuals with pale yellowish skins and a tendency to swelling of the glands.

Arsenic is specific in its action in certain diseases, in the form of arsphenamine in the treatment of syphilis and yaws. This drug also has a great influence in the amelioration of the symptoms of pemphigus, dermatitis herpetiformis, mycosis fungoides and lichen planus. Arsenic is of use in certain cases of psoriasis.

The topical administration of arsenic by the general practitioner, in all skin eruptions, cannot be too severely condemned. This drug is frequently not only irritating to the layer of the skin, from which many outbreaks arise, but may also act as a direct irritant to the mucous membrane of the stomach. There is not only the danger of acute poisoning, because of large doses, but chronic poisoning may result in marked pigmentation of the skin, warty growths on the palms and soles, and eventually the development of epitheliomata.

Sedatives.—Opium and its various derivatives have a tendency to cause itching of the skin, and are, therefore, contraindicated in inflammatory outbreaks. Bromides are not infrequently given, and are helpful in the relief of itching. Acetanilide, antipyrin and phenacetin help in alleviating the intense itching of eczema and urticaria. Valerian is a useful drug to be given to nervous or neurotic individuals who complain bitterly of intense pruritus. Veronal, sulphonal or luminal are of use for their mild narcotic influence.

Animal Extracts.—Preparations made from the thyroid, adrenalin, pituitary and other glands have in recent years been employed largely in various dermatological conditions. Thyroid gives brilliant results in the treatment of myxedema, and it is of some value in ichthyosis, scleroderma and alopecia areata. Pituitary gland substance has occasionally been helpful in psoriasis.

Local Treatment.—Several points should be emphasized in regard to local treatment. Soaps are frequently irritating, particularly the strong soda soaps (sapo viridis), and their entire elimination is frequently indicated in acute eruptions, such as eczema or dermatitis. Water is usually hard and, therefore, irritating, and is also to be excluded in acute outbreaks.

Lotions should be given the preference on oozing surfaces. In dry eruptions, or on those with but slight oozing, salves or pastes

have a markedly beneficial action. If lotions dry too rapidly and do not have a sufficiently prolonged effect, 10 to 15 minims (0.6 to 1.) of glycerin to the fluidounce (30.) of the base corrects the failing. Pastes should never be employed on a hairy part, because of the difficulty experienced in removing the starch contained in the base with water.

Cleansing in practically all acute eruptions of the skin is effected by uncarbolized vaseline (petrolatum), sweet oil, olive oil, or oil of sweet almonds, rather than with soap and water.

The mistake is usually made of employing too much bandage, or covering, in dressing an eruption, thereby heating the affected part and increasing the itching.

Lotions should be mopped on the lesions and never rubbed in unless there is a special indication. Pastes are usually applied directly to the lesions in a thin even coating, or the affected area is covered with the preparation, spread evenly and thinly upon a thin layer of gauze, lint, muslin or linen and held in place by one or two turns of a bandage, or a few small strips of adhesive plaster. Salves or thin bases, not containing starch, frequently are rubbed into the surface, depending naturally upon the acuteness of the condition to be treated.

Always treat acute conditions of the skin with mild preparations, in the beginning at least. It is surprising the results that are obtainable with even such a weak formula as a saturated solution of boric acid, applied more or less continuously to an acute outbreak.

If the diagnosis is not absolutely clear, it is well to apply a mild lotion or ointment, rather than make the condition worse and obscure the disease by the application of too stimulating remedies.

Baths.—Water used in every-day life is so apt to be hard and, therefore, irritating to sensitive skins, and particularly those with a cutaneous outbreak, that very frequently it is wise to make the water softer and of a less irritating character by the addition of one of the following applications.

Potato-starch bath	1 pound of starch
Gelatin bath	1 to 3 pounds of gelatin
Linseed bath	1 pound of linseed
Marshmallow bath	4 pounds of marshmallow
Size bath	2 to 4 pounds of size

The bath should be warm and the individual should remain in the water from ten to twenty minutes.

The soothing bath most frequently employed is the bran bath. Take 3 quarts of bran, sew into a clean bag and squeeze thoroughly in the bath for five to ten minutes, and then bathe in the milky warm water. Fresh bran is sewed into the bag for each bath. These baths are taken without soap, and are of use in inflamed

conditions of the skin. They may be used with care in eczema, although frequently it is best to use no soap or water. They are soothing in erythema, urticaria, etc.

Alkaline baths, consisting of bicarbonate of soda, 2 to 10 oz. (60. to 300.); or potassium carbonate, 2 to 6 oz. (60. to 180.); or borax, 3 oz. (90.), are also soothing.

Stimulating Baths.—Acid baths, consisting of nitric acid, ½ to 1 oz. (15. to 30.); or muriatic acid, ½ to 1 oz. (15. to 30.), have been employed in chronic pruritic diseases.

Iodine bath, made up of iodine, ½ to 1 dr. (2. to 4.); potassium, ½ oz. (15.); liquor potassæ, ½ oz. (15.); glycerin, 2 oz. (60.), has been used in chronic squamous diseases.

Bromine bath, composed of bromine, 20 drops (1.3), and potassium iodide, 2 oz. (60.), has also been used in the latter class of diseases.

Mercurial bath, consisting of the bichloride of mercury, 3 dr. (12.); hydrochloric acid, 1 dr. (4.); water, 1 pint (480.), may be employed in syphilis and pityriasis rubra.

Hyposulphite bath is thoroughly recommended in all chronic scaly conditions, such as squamous eczema, psoriasis, thickened patches of seborrheic dermatitis, ichthyosis, harsh and dry skins, thickened and horny condition of the follicles and in pustular conditions, if not too inflammatory. Two to 4 heaping handfuls of the hyposulphite of soda are added to each bath.

Soaps.—Soaps are usually contraindicated in inflammatory diseases of the skin, as they cause irritation.

The soothing soaps most often used are the boric acid or the thymol. Those employed to soften thickened areas are the salicylic acid or the combination of sulphur and salicylic acid. The germicidal soaps, in addition to the two latter, are tar and betanapthol. Tincture of green soap is employed for the removal of thick crusts or scales, and at times for shampooing the scalp in mild dandruff.

Poultices.—Although flaxseed is employed in the treatment of furuncles and carbuncles before the suppurative stage is reached, a much more cleanly application consists of a saturated solution of boric acid kept constantly wet, the application being frequently changed. For softening crusts and soothing the inflamed surfaces, there is no better application than the starch poultice recommended by Jamieson. The latter is made by adding a teaspoonful of powdered boric acid to a tablespoonful of starch, mix with a little cold water, then pour in a pint of boiling water and stir until melted; let stand until cool, spread the cold starch thickly on pieces of cotton, cover with muslin and apply to the part, changing every few hours.

Local Applications.—Lotions.—Lotions are made up in various preparations, such as water, witch-hazel, camphor water, lime water, rose water and various alcoholic solutions.

Soothing Lotions.—The following combinations are very soothing and can be applied to acutely inflamed surfaces: Saturated solution of boric acid or sodium borate, 3 gr. (0.18) to the fluidounce (30.); to which may be added sodium hyposulphite, 5 gr. (0.32), and sodium salicylate, 3 gr. (0.18); the two latter, particularly to hairy surfaces.

For *inflammation with oozing*, one of these latter preparations are of use in the order of their astringency: Powdered zinc oxide, 2 dr. (8.); boric acid, 1 dr. (4.); lime water, 4 fl. oz. (120.); powdered zinc oxide, 2 dr. (8.); powdered calamine, 2½ dr. (10.); witch-hazel, 4 fl. oz. (120.); or boric acid, 1 dr. (4.); bismuth subgallate, 2 dr. (8.); camphor water, 4 fl. oz. (120.).

For *inflammations without oozing:* Resorcin, 20 gr. (1.3); bismuth subcarbonate, 2 dr. (8.); water, 4 fl. oz. (120.).

If these preparations are too drying, glycerin, 10 to 15 minims (0.6 to 1.) to the fluidounce (30.), may be added.

If there is a considerable amount of itching present, phenol, 5 to 10 minims (0.3 to 0.6), may be added to each fluidounce (30.); or menthol, ½ gr. (0.03); or thymol, ¼ gr. (0.016).

If the condition is not particularly inflammatory, and rapid drying is desired, particularly on the scalp, alcoholic preparations are frequently used. The medications are then made up in alcohol, or 4 to 6 parts of alcohol and 4 to 6 parts of camphor water or plain water, or in cologne water.

Stronger Lotions.—A stronger astringent lotion, which is frequently applicable to such diseases as acne vulgaris, acne rosacea and keratosis senilis, is composed of 15 gr. (1.), or less, of each of the sulphate of zinc and the sulphuret of potash to the ounce (30.) of water, mixed separately in water and then combined. If the bloodvessels are dilated, it is frequently of benefit to add to this so-called *lotio alba*, just mentioned, liquor adrenalin chloride (1 to 1000), 15 minims (1.) to the fluidounce (30.). Two other stimulating astringent lotions, which are applicable, particularly to acne cases, are *Kummerfeld's lotion*, consisting of spirits of camphor and spirits of lavender, each ½ dr. (2.); precipitated sulphur, 15 gr. (1.); cologne water, 1 fl. dr. (4.); distilled water, 2 fl. oz. (60.); and the other, *Vleminckx's solution*, calcis viva, 4 dr. (16.); sublimated sulphur, 1 oz. (30.); distilled water, 10 fl. oz. (300.); boil together with constant stirring until the mixture equals 6 fl. oz. (180.), and then filter.

Liquor carbonis detergens (composed of 1 part of coal tar and 8 parts of water, in the strength of 1 dram to the ounce of water,

or even the full strength is efficient in thickened patches, such as squamous eczema or psoriasis.

Ointments and Pastes.—Ointments are used on the hairy surfaces or on patches that are slightly oozing or on extremely dry skins. The most frequently employed salve base is petrolatum. The others that are in general use are lanolin, benzoinated lard, cold cream and goose grease, the latter having the greatest penetration. A very suitable base consists of lanolin, 2 dr. (8.), and petrolatum, 6 dr. (24.).

A good *soothing ointment* consists of 20 gr. (1.3) of boric acid to the ounce (30.). For itching, menthol, 2 gr. (0.12); phenol, 5 to 10 minims (0.3 to 0.6); or camphor, 10 to 20 gr. (0.65 to 1.3), may be added to each ounce (30.).

For *crusted conditions* of limited distribution, ammoniated mercury, 10 to 20 gr. (0.65 to 1.3), may be added.

For *slight stimulation*, particularly if there is some thickening of the surface, resorcin, 5 to 10 gr. (0.32 to 0.65); or salicylic acid, 5 to 10 gr. (0.32 to 0.65); or calomel, 10 to 20 gr. (0.65 to 1.3), to the ounce (30), may be used.

The various *parasitices*, such as sulphur, ½ dr. to 1 dr. (2. to 4.); or betanapthol, ½ to 1 dr. (2. to 4.); or balsam of Peru, ½ to 1 dr. (2. to 4.), may be employed to the ounce (30.) of the base.

Stronger applications, such as liquor carbonis detergens, 1 dr. (4.), and stronger, to the ounce (30.), and the more stimulating and less agreeable oil of cade (oil of juniper tar), 1 or more drams, or the official tar ointment, are of use in thickened scaly eruptions.

Chrysarobin, 10 gr. (0.65), to the ounce (30.) of paste, is applicable to very thick squamous patches of localized extent, exclusive of the scalp and face.

Paste Bases, by holding the medication directly in contact with the lesion, are frequently indicated, excepting on a hair part and where there is much oozing. Lassar's paste, consisting of 2 dr. (8.) each of powdered zinc oxide and powdered starch and 4 dr. (16.) of petrolatum, is frequently employed. To make a smoother application, the subcarbonate of bismuth in the same strength may be substituted for the zinc oxide.

C. N. Davis has devised an excellent base which is particularly suitable for applications used on the scalp and for chapped surfaces. It has been termed "unguentum stearoglyceride," and is made as follows: Stearic acid, 8 oz. (240.); glycerin, 3 oz. (90.); potassium carbonate, 2 dr. (8.); sodium borate, 48 gr. (3.); water, 30 fl. oz. (900.); oil of rose geranium, 5 drops (0.3). Melt the stearic acid on a water bath, dissolve the potassium carbonate and the glycerin in 4 fl. oz. (120.) of water; add this solution to the stearic acid with continued heat and stir for fifteen minutes, or

until the effervescence has ceased. Dissolve the potassium carbonate in the remainder of the water and add to the previously formed mixtures and, as it cools, stir rapidly. Sodium salicylate should be employed in this base instead of salicylic acid if the latter drug is indicated.

The base used by Arthur Van Harlingen gives excellent results in some of the oozing conditions upon non-hairy parts: Powdered kaolin (30.), powdered zinc oxide (20.), glycerin (30.), liquor plumbi (120.).

A very suitable base for the treatment of leg ulcer consists of equal parts of lead plaster and petrolatum. This latter application works extremely well on hypertrophic scars and keloid, particularly if salicylic acid, 10 gr. (0.65), is added to each ounce (30.).

Scarlet red in a 2 per cent strength, made in the above-mentioned paste, is effective in exciting healthy granulations on a raw surface.

Oily Preparations.—Two of these latter preparations should be mentioned: The well-known carron oil, consisting of lime water and olive oil, equal parts; and calamine liniment, composed of powdered calamine, 40 gr. (2.6); lime water and olive oil, each ½ oz. (15.). The former is applied to burns and extremely inflammatory areas, either uncombined or with the addition of a 1 per cent solution of picric acid; and the latter to inflamed and oozing eczema.

Dusting Powders.—If itching and burning are present and the surface is inflamed and dry, the following combination is efficacious: Menthol, 8 gr. (0.5); phenol, 20 drops (1.3); camphor, 40 gr. (2.6); boric acid, 4 dr. (16.); powdered talcum, 4 oz. (120.).

Plasters.—Ichthyol plaster, made by Seabury & Johnson, is useful in the early stage of a furuncle, folliculitis, acute bursitis, inflamed corn, etc. In the place of this the following combination may be employed: Ichthyol, 2 dr. (8); lead plaster, 4 dr. (16.); petrolatum, 2 dr. (8). For thickened, horny, verrucous or localized, very much thickened squamous areas, salicylic acid plaster, made by Johnson & Johnson, is of use; or salicylic acid, 1 to 2 dr. (4. to 8.); lead plaster, 3 dr. (12.); petrolatum, 4 dr. (16.), may be used.

Caustics.—These preparations are used for the destruction of various growths. Arsenic is used in the form of arsenious acid, 1 to 2 parts to an equal quantity or 1 part of powdered acacia. This is mixed with a 20 per cent solution of cocaine just before using to make a paste. The technic is described under Epithelioma. The list of caustics is long, and but one other preparation will be mentioned, and that is trichloracetic acid. C. N. Davis has probably used this application more extensively than anyone else, and was among the first to realize its efficacy. It is applicable to all epidermic growths if not too deep-seated. It has been men-

tioned in other parts of this work in the treatment of warts, molluscum contagiosum, lupus erythematosus, pigmented and vascular nævi, milium and various other cutaneous conditions.

SPECIAL METHODS OF TREATMENT.

Autoserum and Foreign Proteins.—Injections of serum, obtained from other individuals, or from the patient's own blood, have been employed in a number of affections, such as pemphigus, dermatitis herpetiformis, chronic urticaria, psoriasis, persistent cases of eczema and various other chronic itching diseases, with asserted remarkable results. Horse serum has occasionally proved helpful in hemorrhagic purpura.

Foreign protein, in the form of typhoid vaccine prepared from an active culture, has, in a few instances, been successful in the treatment of psoriasis, urticaria and other cutaneous outbreaks.

Vaccine Treatment.—Some years ago, Metchnikoff formulated the theory that leukocytes played an important part in the body defence against the invasion of bacteria. Leishman determined a means of measuring the resisting power of the leukocytes, their phagocytic activity, to the invasion of the body by a foreign substance. Wright and Douglas proved that the leukocytes only had their phagocytic power by the influence of certain substances in the blood, which they termed "opsonins." The opsonins supposedly lower the resistance of the bacteria so that they are easily destroyed by the leukocytes (phagocytes).

The injection of a fixed amount of a thoroughly sterilized culture of bacteria increases the resisting power of the blood against certain organisms. The vulnerability of an individual's blood, or a weakness of their opsonins, can be determined by mixing measured quantities of the serum of fresh blood with suspensions of the infecting organisms and counting the number of bacteria ingested by the leukocytes (phagocytes). The opsonic index, or the resisting power of the individual to the invasion of certain bacteria, is thus ascertained.

Bacterial injections may be prepared from the organisms that are abstracted from the patient (autogenous vaccines), or from cultures prepared in bulk and made independently of the individual (stock vaccines).

The dosage may be controlled by testing the opsonic index of the patient or by the clinical results obtained. If it is found that the index of the patient is raised after an injection, the resisting power to the invading organism has been increased; therefore, the size of the next dose can be larger. If the index remains the same, the next injection should be smaller or the same dose may be

repeated at a great interval. If the index has been lowered by the treatment, too large an injection has been given and the next dose should be smaller, and at the same or longer interval. If the opsonic index remains stationary after several injections, although the dosage has been increased, the greatest resistance of the blood to the invading organism has been obtained by this means and other methods should be employed, or a delay of several weeks should ensue and the injections may then again be tried.

The effectiveness of this method of treatment can be easily determined clinically. If the condition is improved after the first injection, the dosage at the ensuing treatment should be increased. The injection is then increased on each occasion until the outbreak is cured. If the condition remains stationary, the injection may be increased in size, but if the outbreak becomes worse the dose should be decreased or the interval lengthened. It is best to give the same dosage for two or three times if the outbreak remains stationary, however, before the dose is increased. The clinical result, therefore, tells us fairly accurately as to the opsonic index. While the condition is improving the index is increasing; when stationary, so likewise the opsonic index; and if worse, the latter is lowered.

Vaccine injections are usually employed once each week. The initial dose should not be too large.

Bacterial injections have been administered in patients suffering with furuncles, carbuncles, sycosis vulgaris, acne, various other pustular conditions and tuberculosis of the skin. The results have frequently been brilliant, but in quite a number of instances extremely disappointing. Vaccine treatment will be further mentioned under the above diseases.

Phototherapy (Finsen Light, Actinotherapy).—The bacterial properties of light were demonstrated first by Downes and Blunt in 1877. Bacteria may be destroyed in tissues exsanguinated by pressure, at a depth of 1.5 mm., and their growth retarded at a depth of 4 mm. beneath the skin. The stimulating effects of the light probably have a deeper penetration.

In 1896, Niels R. Finsen, of Copenhagen, published a report of the use of concentrated actinic rays of light in the treatment of diseases of the skin, particularly lupus vulgaris. This therapeutic measure has since been known as the Finsen light treatment. Both the light from the sun and from a powerful electric arc lamp may be used, the latter being more constant and dependable.

The light from a powerful electric arc is condensed by means of a series of lenses, enclosed in a metal tube so as to form chambers which are filled with distilled water to absorb the rays of heat. The lenses are made of rock crystal, as glass absorbs too large a

proportion of the ultraviolet, the most highly bactericidal rays. The collecting lenses are 7 cm. in diameter, and the rays are brought to a focus about 6 or 7 inches from the lower end of the tube. Surrounding one of the lower divisions, containing water, is an outer jacket, through which ordinary cold water circulates, thus preventing overheating. In Finsen's original apparatus, an

FIG. 10.—The Finsen-Reyn lamp in operation. (Allen.)

arc light of from 60 to 80 ampères and of about 70 volts was employed. Four separate metal tubes were attached to the lamp; therefore, 4 patients could be treated simultaneously.

A *smaller lamp* has been devised by Finsen and Reyn, with practically the same mechanism, but employing only one tube, of shorter focal distance, and by so directing the arc that the stronger

rays all fall directly on the first lens, 20 ampères and 55 volts give results equal in every way to the larger apparatus.

The *chief effects* from this form of treatment are: The property of concentrating rays of light to destroy bacteria; penetration of light rays into and through living tissue; and their ability to cause certain structure changes of an inflammatory character.

Two rock crystal lenses set in a frame, with water running between the two, are employed as a compress to make the cutaneous surface anemic, so that the integumentary blood supply shall not act as a filtering screen to exclude the chemical rays. The compressing lenses of a suitable size and shape, for the area to be treated, are held by an attendant, or securely fastened to the surface by means of elastic bands. The portion of skin to be treated is brought just within the focal point of the distal condenser of the tube, the light covering an area of $\frac{1}{2}$ to $\frac{3}{4}$ of an inch. The duration and frequency of the light applications depend upon the depth of the disease, the extent of the pathological condition and the individual susceptibility. Seances last from twenty minutes to one hour or longer. The maximum period is usually employed in lupus vulgaris.

Eight to twenty-four hours after an application of these rays, an inflammatory reaction develops in the area treated, which may be of a mild erythematous nature or of a severe type, such as bleb formation and considerable swelling. The reaction on subsiding in the normal skin usually is followed by more or less pigmentation, which usually disappears in ten days to two weeks. A dilatation of the bloodvessels of the part may be a sequela, lasting for some months. The inflammation produced by the light causes no necrosis and no destruction of normal tissue, hence the inconspicuous scars produced and the value of the treatment from a cosmetic aspect.

In order to lessen the time of application and the cost of the apparatus, the *Lortet* and *Genoud* and the *London hospital lamps* have been devised, utilizing the Finsen idea. These are of moderate bulk and force, much cheaper in cost, without the telescopic arrangement of lenses, and suitable for attachment to the house current. The essential parts are two carbons approximated by hand screws to form an arc light, a metallic double-walled shield, with a constant current of water running through it to keep it cool. The condensing lens is brought within 2 inches of the arc portion of the lamp; the latter is shielded by a metallic jacket, through which water constantly circulates. The diseased area is pressed by the patient against the lens. An area 4 or 5 cm. in diameter may be treated at each application. An erythematous or bleb formation may be produced by a thirty-minute exposure.

The rays are, however, superficial in action and, therefore, not suited for deep-seated conditions. It may be used to cause a surface reaction in such conditions as alopecia areata and lupus erythematosus. An ampèrage of 10 or 12 and a voltage of 55 are necessary.

Kromayer has suggested the use of a *quartz mercury-vacuum lamp*, made of melted quartz glass, embedded in a running water bath, whose casing, the size of a fist, permits the exit of light through a quartz window. The rays given off from the incandescent mercury vapor are of a blue, violet and ultraviolet color. The ultraviolet rays are largely absorbed by the enveloping envelope of glass.

Schott has made a *Uviol lamp* (ultraviolet light lamp), in which a glass-like material, said to be composed of a barium-phosphate-chrome combination, is employed. This substance allows the free passage of the ultraviolet rays. A five- to ten-minute exposure at 6 to 10 cm. may produce an erythema. The distance the lamp is from the surface and the length of the exposure determine the inflammatory reaction. It has proved of benefit in the hands of some dermatologists in acne, alopecia areata, and some forms of eczema.

Other lamps have been employed therapeutically, with electrodes of carbon, carbon iron and iron, which project the actinic rays by a large concavo-convex reflector, giving a heat reaction to the surface. This form of lamp may prove useful in psoriasis and certain cases of eczema.

In 600 cases of lupus vulgaris, treated by the *Finsen method* at the London Hospital, only 7.8 per cent failed to respond or did better under other methods. The *Finsen-Reyn apparatus* was just as successful in Sequeira's hands as the more cumbersome Finsen light. Next in point of value in this disease is the *Kromayer lamp*. Actinotherapy has proved most successful in this disease, probably because of its destructive action on the tubercle bacilli found in the diseased tissue. The results reported from the Finsen Institute of Copenhagen by this method of treatment have proved most successful, cures having been effected in a large percentage of cases, after, in a great many instances, years of persistent, careful and patient treatment. The results obtained by this particular method in *lupus erythematosus* have not been particularly satisfactory and no better than other more easily carried out measures.

Alopecia areata has responded in numerous instances to the stimulation of the Finsen rays, particularly in the cases treated by Kromayer.

Although betterment has been effected in vascular nævi, par-

ticularly the superficial type (port-wine marks), cure has not been produced.

Acne and various other subacute inflammatory conditions have had light rays applied with reported successful results.

High tension and frequency currents were probably first introduced into therapeutics by d'Arsonval, but Oudin was the first to use them for diseases of the skin. Various shaped electrodes have been designated for its application, the hammer-shaped vacuum electrode and those with a carbon and glass point. Where a circumscribed action is required, a pointed metallic electrode is of use.[1]

Radium Treatment.—In the year 1896, Becquerel discovered the radiating power of uranium and some of its salts. Later, the Curiés separated both radium and polonium and thorium. Polonium was isolated from pitchblende and is a metal belonging to the bismuth group, while radium belongs to the barium group. Radium has a radioactivity 2,000,000 times as great as uranium. Recently, Debierne has separated a similar body, actinium.

Radium has only recently been isolated in its pure metallic state. It is usually employed in the form of radium bromide or chloride and is commonly used in combination with barium salts.

The energy of radium is expressed in relation to that of uranium as a unit. The radioactivity of various specimens of radium varies from 1000 to 1,000,000.

Radium bromide is in the form of a brownish powder, and is enclosed in variously sized and shaped aluminum or mica-covered capsules or in glass tubes. As a rule, radium is mixed with three times its weight of barium salt, and a preparation with a radioactivity of 500,000 is obtained, taking pure radium as having a radioactivity of 2,000,000. This mixture may be spread evenly upon a plate, circular or square in shape, and it is kept in shape by a special varnish. This varnish can be cleaned with the usual antiseptics, but cannot be sterilized by heat or long solution in spirit. The weaker mixtures of radium and barium are whitish in color.

Radium gives off three sets of rays: The alpha, or superficially acting rays; the beta, which have 100 times the penetration of the alpha; and the most penetrating, or gamma rays, which are 10,000 times more penetrating than the alpha.

The *alpha rays* will not penetrate a thin sheet of aluminum. The *beta rays* will pass through aluminum, but most of them are cut off by interposing a thin sheet of lead. The *gamma rays* will pass through lead and will influence a gold-leaf electroscope even

[1] MacKee: Jour. Cutan. Dis., 1909, p. 245.

through an inch of the metal. Thus, any of the rays may be employed therapeutically. The alpha rays cause a superficial dermatitis, and their use is confined to the treatment of superficial skin affections. The interposition of a thin layer of aluminum prevents superficial reaction and allows the more penetrating action of the beta and gamma rays without producing a severe skin reaction. When it is desired to influence deep structures only, we use filters of lead, but a longer exposure is then required. The filter itself, however, after a time, becomes radioactive and gives off secondary rays with a low penetrating power; their action can be eliminated by interposing layers of paper between the lead filters and the skin. The radioactivity of the specimen employed, the length of the application and the proximity to the surface treated govern the reaction obtained.

Prolonged exposures to radium cause a series of destructive effects very similar to those caused by the roentgen-rays; we may get superficial or deep ulceration, with very slow healing.

In dermatological practice, the element in a flat applicator, or the emanation in tubes arranged in suitable order, best meet the needs. Occasionally, the element in a tubular applicator or needle can be readily employed in a depression, sulcus or small cavity.

The skin diseases, in which radium is especially indicated, and the approximate dosage to be employed are as follows:

Angioma.—Port-wine marks can be made to disappear in many instances with repeated short exposures of radium. Twenty minutes to one-half hour to each area may cause marked improvement when a 10-mg., half-strength plaque is used. There is apt to be atrophy and telangiectasis when the growth has been removed.

Strawberry marks should have a light aluminum filter to ensure a deeper action of the radium.

Verruca.—When the growths are few in number, radium affords an ideal agent for the removal of warts. They should be closely surrounded by lead and exposed one hour unfiltered to the rays of a 10-mg. plaque. Planter warts require at least double the usual time.

Keratosis.—Roentgen-ray or senile keratoses are usually cleared up by radium, with excellent cosmetic results.

Leukoplakia.—Radium appears to have a better effect than the roentgen-rays, according to most observers. In personal experience this has been corroborated.

Epithelioma.—Small growths of the basal-cell type will usually respond with from 50 to 100 mg. hours, the growth being fairly closely screened from the radium, lightly filtered with aluminum or brass or without other filter than rubber tissue. The prickle-cell cancer required more filtration and longer exposures to the radium.

Keloid.—When treated early and of moderate thickness, little or no filtration is required. Later, filters must be proportioned to the age, density and thickness of the growth.

Lupus Vulgaris and Tuberculosis Verrucosa Cutis.—These are favorably influenced.

Lupus Erythematosus.—A half-strength plaque may be used over the eruption without metallic filtration, the position of the applicator being changed every twenty minutes to one-half hour until the entire area has received radiation. This treatment may be repeated in two to four weeks.

Eczema, Psoriasis, Lichen Planus.—These and other chronic inflammatory conditions, when localized and in small patches, can be removed by radium.

Radiotherapy (Roentgen-rays).—In 1895, Prof. Roentgen, of Würzburg, discovered in experimenting with an electric current running through a Crookes' tube that certain rays were given off of an unknown action which he designated *x*-rays. Freund and Schiff, of Vienna, were the first to ascertain the important part that these unknown rays were to play in cutaneous therapeutics.

The mode of action of the roentgen-rays is quite complex. They stimulate and alter the function and structure of living cells, thereby increasing their resistance to the action of bacteria or their power in destroying them. They have a marked action in causing a breaking down of tumor cells and creating an absorption of the same. The action in certain cutaneous conditions may be due to atrophy of the glands and follicles, to the physical and chemical stimulation of the cells and promotion of absorption of the inflammatory infiltrate, to their depilatory action, and their analgesic influence.

Modern roentgen-ray equipment[1] is furnished by a number of commercial houses. The cost of a laboratory designed for superficial therapy is well over $1000 for the least expensive type; for exceptional facilities the outlay may total from $5000 to $8000. Without entering into the details, the barest requirements are: A suitable source of electric power, an interrupterless transformer, a Coolidge tube with its transformer, a tube stand, a plain wooden table or reclining chair, and the necessary aërials, wiring and protection by screens, shields, lead foil, etc.

Omitting all mention of the physical forces and mechanical appliances employed to actuate the roentgen-ray tube, for which the reader is referred to appropriate special text-books, it is proper to designate the method used to estimate dosage. Superseding the pastille and various other radiometers (so-called direct technic),

[1] Indebtedness is acknowledged to Dr. Edward F. Corson for assistance in the preparation of this section.

the dosage is now usually computed by arithmetical equations, the indirect method. Until the advent of the interrupterless transformer and the Coolidge tube, this means of estimating roentgen-ray dosage was unreliable, but has now become highly dependable. MacKee, Remer and Witherbee have done much to establish this method of computation. It is accomplished by means of four readily ascertained factors placed arbitrarily in an equation. They are:

1. The number of milliampères.
2. The spark gap in inches.
3. The distance from the target of the Coolidge tube to the patient's skin in inches.
4. The time of the exposure in minutes.

The equation is made as follows:

$$\frac{\text{milliampèrage} \times \text{spark gap} \times \text{time}}{\text{Distance} \times \text{distance}} \quad \text{or} \quad \frac{\text{Current} \times \text{voltage} \times \text{time}}{\text{Distance} \times \text{distance}}$$

The result gives the intensity of the dose at the surface of the skin. Variations of these factors give uniform alterations in the dosage. In the preceding it should be understood that no filter is used.

Following the teachings of MacKee, the factors of milliampères, 2; spark gap, 6; time, three minutes; and distance, 8 inches, have been found reliable and convenient to produce one skin unit. Substituting in the equation, they read:

$$\frac{2 \times 6 \times 3}{8 \times 8} = \frac{36}{64} = 1 \text{ skin unit (4 H)}$$

Any variation in any of the factors influence the dose delivered and can easily be expressed in a simple fraction. This gives a standardized technic, which can be reproduced almost identically on any interrupterless transformer. In the foregoing equation, the dose may be divided or multiplied by decreasing or increasing the time of exposure without alteration in the other factors. Thus, if one wishes to give $\frac{1}{4}$ skin unit with a 6-inch spark gap, 2 ma. and 8 inches skin-target distances, he would expose the part to the action of the rays for forty-five seconds (one-quarter of three minutes); $\frac{1}{2}$ skin unit would require one and a half minutes; $\frac{3}{4}$ skin unit, two and a quarter minutes; and $1\frac{1}{4}$ skin unit, three and three-quarters minutes. The latter constitutes the erythema dose (unfiltered), the maximum dose to be given except in certain cases hereafter mentioned.

Ill-effects follow over-application of the roentgen-ray. Burns of the first, second and third degrees are early consequences, and telangiectasia, atrophy of the skin, pigmentation, alopecia and

chronic radiodermatitis, sometimes leading to the formation of epitheliomata, are among the late sequelæ. Ordinarily, it is best not to employ more than one skin unit in any given month, counting all the fractional doses administered. Protect carefully the surrounding normal skin, hairy parts, eyes, ears and testicles. Avoid the use of certain drugs, locally at least, two weeks before and after treatment with roentgen-rays, notably sulphur, scarlet red, benzoic acid, iodine, tar, resorcin, chrysarobin, betanapthol and mercury.

Acute inflammations respond most quickly and vigorously to the action of the rays. Next in order come chronic inflammations, granulomata, neoplasms and normal skin.

The principal diseases in which the roentgen-rays are commonly employed with success and the dosage given the average case are as follows:

Acne Vulgaris.—One-quarter skin unit every week for, at most, sixteen weeks, or ½ skin unit every two weeks for ten treatments. Excellent results are obtained both on the face and trunk. For the face, usually three exposures are made at each treatment period, one on each cheek, centering on the zygoma and half the time of the lateral exposure to the front of the face. Protect the eyes, ears, scalp and chest with lead.

Sycosis Vulgaris.—When affecting the beard and mustache area, the latter is treated by several weekly doses of ¼ skin unit focussing on center of upper lip, the patient being in the dorsal position on a table and the tip of the nose, eyes and scalp protected. The beard is treated with the head thrown back, on the point of the chin. Protect the eyes, ears, scalp and chest.

Tinea Tonsurans.—The Kienbock-Adamson technic consists in successive exposure of five points on the scalp, each point equidistant from its neighbors by 5 inches. The dose in each instance is 1 skin unit, all 5 being administered at one seance. Each exposure covers its own area and overlaps the adjoining areas. Protect the face, ears, neck and shoulders. The hair is clipped, ears folded forward and fastened with adhesive and points marked with blue pencilled tabs of adhesive.

Favus.—Favus is more resistant to the rays, but should be treated in a fashion similar to the preceding disease.

Eczema.—The protean character of this disease causes varying degrees of dosage from ⅛ to ½ skin unit applied at from weekly to monthly intervals. Lichenification, dermatitis, eczematoid ringworm and allied conditions respond in a marked degree to the treatment. The skin surrounding the diseased areas should be protected.

Psoriasis.—Psoriasis is usually markedly improved by roentgen-rays, but rarely cured. One-fourth to ½ skin unit may be administered every two weeks. The scalp treatment is by the Kienbock-Adamson technic, but with reduced dosage. Protect unaffected regions.

Lichen Planus.—Lichen planus frequently is markedly benefited and often cured, especially the chronic cases. The dosage given is usually ¼ to ½ skin unit every two weeks or half that quantity weekly. When localized and hypertrophic, screen rather closely with lead foil and employ larger doses.

Pruritus Ani et Genitalis.—Pruritus ani et genitalis frequently responds better to the roentgen-rays than to any other form of therapy. One-quarter to ½ skin unit is administered every two weeks. Surrounding parts and, especially, the testicles are to be protected.

Granuloma Fungoides.—Small doses usually have a marked effect upon the lesions. One-eighth to ½ skin unit every one or two weeks.

Lupus Vulgaris.—From ½ skin unit every two weeks to 1 skin unit every four weeks may be employed.

Tuberculosis Verrucosa Cutis.—The lesions, closely shielded, may be given 2 skin units if the patch is sufficiently thick to require that dose.

Erythema Induratum. One-half skin unit every two weeks encourages resolution of the lesions.

Verruca.—If dealt with singly, large warts should be closely screened and given 1 skin unit. If a region bearing a number of warts is to be treated, the dose should be smaller, and the normal skin protected with a metallic paste.

Keratoses.—Close screening and the administration of ¾ to 1 skin unit frequently suffices to clear up the condition. The horny layer should be removed before treatment.

Keloid.—Various degrees of these growths require a wide range of treatment. It is generally necessary to give a number of intensive treatments; for instance, 1 skin unit each four weeks for some months.

Epithelioma,—Vigorous treatment is necessary and should be persisted in until results are obtained. The dose should not be less than 1 skin unit—2 or even 3 at one treatment may be required. At least ¼ inch of surrounding skin should be allowed to receive treatment, although not to the extent of the actual lesion. The more powerful treatments mentioned should not be repeated under four weeks. The basal-cell type is most amenable to the roentgen-rays.

Fulguration, or Keating-Hart Method of High-frequency Spark.—This method consists in the application of long and powerful

sparks for the destruction of diseased tissue. The apparatus may be any of the resonators giving high-frequency currents, and may be either monopolar or bipolar, the latter being preferable. The patient holds a metallic electrode connected with one pole of the resonator, while the spark electrode is brought near the diseased area. This electrode has an insulating sleeve by which the length of the spark is exactly regulated, and a current of air or carbon dioxide is forced through it to keep the temperature from becoming too high. The strongest possible discharges are employed.

Four steps are usually carried out in the treatment of small ulcerative epithelioma. First, several sparks are applied, producing blanching of the tissues and a marked degree of anesthesia; then more powerful sparks are applied, softening the tissues; the tissue that has been treated by the sparks should next be curetted and enucleated, and the same powerful sparks applied to the site of the growth which has been removed, to eliminate any trace of the neoplasm.

Large tumors should first be removed surgically and then the high-frequency sparks applied.

The patient should be anesthetized because of the pain of the operation.

High-frequency sparks seem to have a more or less selective action, being more destructive to morbid rather than to sound tissue.

This method has been employed in epithelioma, tuberculosis cutis, lupus of skin and mucous membranes, and in certain cases of chronic roentgen-ray dermatitis.[1]

Electrolysis (Electric-needle Treatment).—Electrolysis is a very important therapeutic measure in several dermatological conditions. It is our only permanent means for the removal of superfluous hair. Various forms of nævi, particularly the so-called spider nævi, xanthoma, verruca, soft moles and telangiectases, respond admirably to this form of treatment.

Electrolysis as a means of permanently destroying the hair bulb was introduced and popularized by Hardaway, of St. Louis, J. C. White, of Boston, and Piffard, of New York, and has since been used successfully by hundreds of operators.

The apparatus required for the operation consists of a galvanic battery of from 6 to 16 dry cells, a sponge electrode, an exceedingly fine needle, either of steel or, preferably, of iridoplatinum, an electrode needle holder, two cord conductors of $1\frac{3}{4}$ yards in length, and, for accuracy, a milliampèremeter.

The patient is placed in a reclining chair, near a window, so that

[1] Tousey: Electrotherapeutics; Keating-Hart: Archives d' electricité médicale, August 10, 1907.

plenty of light will facilitate the operation. The depilating forceps are placed in alcohol in a small glass on the arm of the chair and also the magnifying glass. The needle in its holder is sterilized in the flame of an alcohol lamp and fastened to the cord connected with the negative pole of the milliampèremeter, or directly with the cord leading to the negative pole of the battery if the meter is not employed. The sponge of the other electrode is saturated with water or salt solution, connected with the cord leading to the positive pole of the milliampèremeter or to the positive pole of the cell. The patient holds the handle of the sponge electrode.

The needle of the milliampèremeter is unfastened by a screw, and the registering needle then has full play as an indicator. The small rheostat is turned for a short distance around the plate to the point giving sufficient current for the operation.

The needle holder is held by the operator in the right hand and the magnifying glass in the left hand. The needle is inserted in the mouth of the hair follicle alongside of the hair toward the papilla, the lessened resistance showing that the needle is properly inserted. A very slight increased resistance shows that the bottom of the hair follicle has been reached. The circuit is now completed by telling the patient to press the sponge of the electrode against the palm of the other hand. The needle is held in position for from ten to thirty seconds, according to the size of the hair, until slight frothing is produced, or a wheal appears around the mouth of the hair follicle. The circuit is then broken by the patient removing the sponge from the palm of the hand and the needle is removed from the follicle.

The needle holder is then placed between two fingers of the left hand, the remainder of the hand still holding the magnifying glass, and the hair is removed by the depilating forceps taken from the alcohol by the right hand. The ease with which the hair is abstracted indicates the completeness of the operation. If the hair does not leave the follicle with the feeblest traction, the papilla has not been destroyed and the operation has been a failure.

As the upper lip is extremely sensitive, and the hairs are usually not particularly large, a current of $\frac{1}{2}$ to 1 ma. is sufficient. The current usually employed on other portions of the face is from 1 to 2 ma.

Circumscribed congestion or a wheal formation is observed immediately after an operation. Subsequently, small papules and pustules may appear, which last over a period of a few days, a week or more.

The face should be thoroughly cleansed with alcohol, both before and after the treatment, and it is a wise precaution to keep the depilating forceps in alcohol during the entire operation, excepting

when in use for the extraction of a hair. Hairs in close proximity should not be removed at the same seance, and the needle should not again be introduced into the same follicle for fear of causing a scar.

The needle is fastened to the negative pole because a small pigmented spot might result if fastened to the positive. An iridoplatinum needle, because of its flexibility, can be bent into any shape desired, particularly to follow the course of the follicle in removing the difficult hairs on the neck. The patient should withdraw the hand slowly from the sponge, in breaking the current, otherwise a slight shock may be experienced.

Warm water should be used freely and frequently following electric-needle treatment, and usually a mild lotion, such as a saturated solution of boric acid, applied several times each day, avoids pustulation.

In the treatment of the *spider nævi*, a current of 2 to 3 ma. is employed. If the needle is placed directly in the center of the lesion, not infrequently the entire mark will disappear. If the coagulation of the blood in the central puncta is not sufficient to remove the mark, at a subsequent treatment the needle may be placed in the radiating tributaries. The merest touch of the electric needle sometimes is sufficient to obliterate the small vessel, while in other instances several seconds are required. The needle should be inserted at slight intervals in the bloodvessels until they are completely blanched.

A current of 2 to 3 ma. is usually sufficient to cause blanching and cure of a *flat xanthoma lesion*. The needle has to be inserted into various portions of the lesion until the entire surface is whitened.

The same strength current or even 5 to 10 milliampères may be used in treating a *wart*. The needle or a spray of needles may be inserted parallel to the skin and slightly above the level of the normal integument. The destroying electrode has to be inserted several times and at different angles. Both electrodes may be equipped with needles or sprays of needles in treating large warts. When the wart turns to a yellowish-brown or dirty gray color the operator knows that the central blood supply has been cut off and the lesion is destroyed. To avoid scarring, several separated treatments may be carried out, the upper portion being first removed, then the middle portion, and finally the lowest part.

Soft moles are easily removed by this method, and the cosmetic result is excellent. The needle is inserted parallel to the skin surface. Several insertions are required at different angles. When the lesion changes color, destruction has occurred. One or two applications are usually sufficient to remove this type of disfigurement.

Telangiectases are obliterated in the same way as the radiations from a spider nævus.

Refrigeration.—Refrigeration as a treatment for skin diseases was introduced in 1899 by J. C. White, who employed liquid air for that purpose. A year later, Dethlefsen tried the ethyl chloride spray, but its action was found to be too superficial in character. Juliusberg, of Breslau, in 1905, recommended liquid carbonic acid as a spray for freezing certain diseased conditions. It remained for Pusey, however, to discover the successful method of employing carbonic acid in a solid form, the latter method having superseded all others.

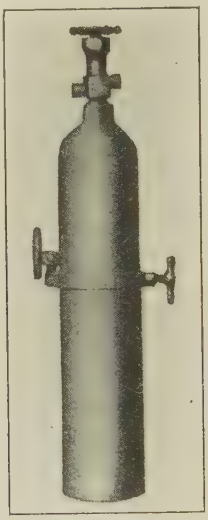


FIG. 11.—Small cylinder for holding carbon dioxide.

Liquid Air.—Liquid air has a temperature of 250° below zero, Centigrade (–418° F). It is a bluish-white, clear liquid, which causes instant freezing when applied to the tissues. It is composed of nitrogen and oxygen, approximately $2\frac{1}{2}$ parts of the former to 1 of the latter, with about $\frac{1}{8}$ of 1 per cent of carbon dioxide. It is extremely difficult to obtain, as it has to be made by a skilled chemist and with expensive apparatus. It evaporates rapidly, and a supply can only be kept for a few days. It explodes if kept in a tightly corked vessel, and is usually stored in a double glass tube; a smaller tube within a larger, a vacuum separating the two. The opening of its container can only be plugged with cotton, so as to allow evaporation and thus prevent an explosion.

The best method of applying the agent is by means of a cotton swab fastened to an applicator. In making the application the swab is dipped into the liquid air until saturated, but the excess is shaken off before using it upon the area to be treated. Its action is rapid and deep.

Solid Carbonic Acid.—Solid carbonic acid is a substitute that has practically the same action as liquid air, although it is not so cold, having a temperature of −79° C., (− 110° F). Carbonic acid is obtained by the combustion of coke and is a by-product in many industries. It is condensed into the liquid form by pumping into cylinders under pressure.

The gas is kept in steel cylinders of various sizes under a pressure of from 850 to 1000 pounds to the square inch, varying somewhat with the surrounding temperature. When the carbon dioxide is allowed to escape in a liquid form it solidifies. Solidification is caused by the sudden expansion with an extremely rapid evaporation of carbon dioxide into a gaseous form plus the great absorption of heat from the remaining carbonic acid. The solid carbon dioxide is white and looks like ordinary snow. It evaporates into gas again unless it be compressed into a firm mass. It may be kept for an hour or more if wrapped in a badly conducting substance, such as lint or cotton wool. A mass of the snow can be held in the hand for a short time, if no pressure is exerted, without freezing the surface because of the constant evaporation of the gas, which forms a layer between the mass of carbon dioxide snow and the skin.

Technic.—When drawing off the carbon dioxide from the cylinder the valve end must be placed at a lower level than the remainder of the receptacle, the vent hole pointing downward. The liquid carbonic acid thereby falls to the valve end of the cylinder and comes out when the vent hole is opened, otherwise only the gas escapes. Small cylinders are fastened by a suitable apparatus at the proper angle for obtaining the gas. Larger receptacles should be maintained on a large block of wood for the closed portion of the tube and on a smaller block for the nozzle extremity. The more liquid that has been removed the greater the elevation that is required to obtain the preparation.

The collection of the snow may be performed with extremely simple or very elaborate appliances. Chamois skin may be fastened as a bag, or simply wrapped around the end of the cylinder covering the vent hole, and several Turkish towels wrapped over this to protect the hands of the collector from the extreme cold. The valve is repeatedly closed and opened to allow the liquid to escape intermittently and not continuously. The snow may be moulded into any shape desired. If the lesion to be treated is quite small, the refriger-

ant may be shaped in a metallic ear speculum. If rounded and larger, wooden pill boxes answer the purpose admirably. A convenient means of collecting and moulding the snow consists of wrapping a piece of thick blotting paper around a broom handle, or a stick of the proper dimensions, to form a cylindrical mould. Wrap this blotting-paper mould in chamois skin and fasten with elastic bands; remove the stick and apply to the outlet hole of the steel cylinder, fastening firmly to the nozzle, and allow the liquid to escape, after placing a cork in the other end of the improvised cylinder. When the blotting-paper mould has become filled with snow, turn off the gas, remove from the vent hole, thoroughly hammer the snow with the stick originally used in making the cylinder, remove the elastic bands, unwrap the chamois skin and the blotting-paper, and a perfectly formed solid stick of snow is found. This mould can be pointed with a knife, cut longitudinally or crosswise, depending upon the lesion to be treated.

Effects of Carbon Dioxide on the Skin.—The effect produced on the skin depends upon two factors, the amount of pressure exerted and the duration of the application. If the pressure be very light the freezing is very superficial, but if firm, the tissues can be frozen to the depth of an eighth of an inch or more. Very much less pressure is required for deep freezing of the skin over a bony or firm part than where the tissues are soft. Shorter exposures should be made to the extremes of the body, such as the rim of the ear, the toes, etc., to young children, and to areas that have previously been treated with the roentgen-ray or radium.

If the application of the snow to the skin has been five seconds or more, the integument after it thaws out becomes red, and in five to ten minutes it is slightly raised above the surrounding surface and of a wheal-like appearance. The outpouring of fluid exudate increases rapidly and in about an hour a blister is formed with clear serous contents. If this blister remains unruptured it generally dries up in a week or slightly longer, and a crust is formed which is cast off some days later. The blisters, however, usually rupture early, leaving a moist, oozing surface, and crusting. There may be a considerable amount of redness, swelling, and edema of the surrounding parts, particularly when the area frozen is in close proximity to the eye. The eye may be closed by the inflammatory reaction following the application of this method. After the crust has been cast off, the area treated is perfectly white and smooth, and if a scar has been produced it is but slightly discernible. The cosmetic result is beautiful. Occasionally there may be slight pigmentation surrounding the white scar.

If the reaction has been very severe the part can be kept constantly moistened with a saturated solution of boric acid and later a boric acid ointment will prove efficacious.

A great many writers have emphasized the painlessness of snow treatment. Almost all of the numerous cases I have treated have complained bitterly of the pain at the time of application and of the intense burning for some hours afterward.

Juliusberg examined the human skin microscopically after freezing with carbon dioxide snow and found marked changes in all portions of the skin. Low found that in experiments carried out in rabbits that the nature of the changes in the skin following the application of the snow was very similar to those after other irritants. The epithelium showed all changes from degenerative swelling to complete cell death. The vessels were thrombosed.

Carbon dioxide snow produces its effect in disease of the skin by thrombosis of the vessels with the cutting off of the blood supply to the part frozen; by direct injuries to the tissues by the freezing and thawing; and exudation of fluids and cells leading to absorption of inflammatory products. (Low.)

The *snow* has proved efficacious in the treatment of vascular nævi, particularly in those more prominent and elevated. The so-called port-wine marks have shown comparatively little improvement under this method. The length of application is usually from twenty to forty seconds, and more than one application frequently has to be given.

Pigmented Nævi.—Small brown moles, flat or raised, can be easily and successfully treated by carbon dioxide snow. Large pigmented nævi are much better treated by snow than by any other known means. Ten to thirty seconds' exposures are given.

Lupus erythematosus, particularly of the discoid type, responds quite well to this method. Short exposures of from five to fifteen seconds are preferred.

Some authorities (Low) have reported favorable results in treating *rodent ulcer*. A long exposure, with heavy pressure, of from forty-five to sixty seconds, is employed.

This method has also been tried in numerous other conditions, such as tuberculosis of the skin (lupus vulgaris), senile keratoses, chronic roentgen-ray dermatitis with keratoses, verruca, papillomata, clavus, keratoses of the palms and soles, chloasma, lentigo, etc.

CLASS 1.

HYPEREMIÆ—HYPEREMIAS.

Hyperemia is simply a congestion or overfilled state of the cutaneous bloodvessels without inflammatory changes in the integument. The condition is exactly opposite to an anemia, in which there is a lessened quantity of blood in the skin, resulting in a blanching of the surface. The dividing line between the hyperemias and inflammation is more from the clinical than the pathological point of view, as most of the congestive conditions show sooner or later an inflammatory change in the skin.

Hyperemias are active or passive; the *active* show an erythematous characteristic, while in the passive the skin is of a dark, livid blue.

Passive congestion is divided into idiopathic and symptomatic. The former is of a localized distribution, and is due to mechanical obstruction of the venous flow, caused by the constriction of tight clothing, bandages, ligatures, or by exposure to cold, heat, or chemical substances. The symptomatic form presents a more or less generalized blueness or cyanosis of the skin, due to some general disturbance of the cardiac, circulatory, or respiratory system which affects the peripheral circulation.

ERYTHEMA HYPEREMICUM.

Synonyms.—Erythema simplex; Erythema congestivum.

Definition.—Erythema hyperemicum is a congestion of the skin, consisting of variously sized patches of a reddish or pinkish color and of a localized or general distribution.

Symptoms.—The characteristic feature of the disease is the redness, which exhibits no infiltration or elevation. The color can be entirely eliminated by pressure, but recurs immediately upon withdrawing the same. The congestion in most cases is of a limited distribution. The skin of the affected area is unusually hot, and there is generally mild itching and burning.

Etiology.—Etiology may be divided into factors of an idiopathic or symptomatic nature, or, as suggested by Crocker, those of local distribution due to external irritation, and those of more or less general distribution caused by internal conditions.

The local causes which may produce the idiopathic form are heat, cold, traumatism, poisons, etc. The erythemas of a generalized distribution are usually caused by internal toxemic conditions. Symptomatic erythemas are due to visceral or nervous disturbances. Flushing and blushing are placed under this heading.

Erythema caloricum is a congestion or redness caused by exposure to extremes of temperature, either the very cold or the very warm. If the sunlight is causal it may be termed *erythema solare.*

Erythema actinica is the term applied to the reddening of the surface produced by exposure to the roentgen-rays. This title may also be applied to congestion caused by the sun, because it is the actinic rays which cause the reaction.

Erythema ab igne is a reticulate, gyrate, and annular erythema that usually occurs upon the anterior surface of the legs, and is caused by exposure to artificial heat, in individuals below the normal standard of health. Most of the few cases that have been reported occurred in adults. Cooks, stokers, kitchen employees and those in close proximity to stoves are the victims of the affection. Hot-water bottles and warm baths have been recorded as causal. Although the outbreak rarely progresses beyond the erythematous stage, thickening of the skin and vesiculation may develop. Perry was of the opinion that the affection was due to an infiltration in the walls of the superficial veins, the outbreak following the distribution of the affected vessels. Rather a congestion than an inflammation, due to a disintegration of the blood in and around the walls of the superficial veins. Hartzell found that the affection was pathologically of an inflammatory nature. The patches tend to disappear with the removal of the cause. When the redness fades, deep brown pigmentation remains.

Erythema traumaticum results from various cutaneous injuries, such as friction, pressure, rubbing, etc., particularly in those with sensitive skins, from the pressure of nose glasses, trusses, and other like articles.

Erythema venenatum is produced by the local action of drugs, such as arnica, mustard, chloroform, strong soaps, dyestuffs, certain plants, etc.

Erythema paratrimma is the title employed, now almost obsolete, to signify the resultant erythema from the pressure of the prone position preceding a bed-sore.

Erythema leve is applicable to the shiny and glistening appearance of the skin associated with an edematous condition of the extremities.

Erythema fugax is a temporary redness which appears in patches and is possibly allied to urticaria.

Erythema urticans is of a somewhat similar nature to the last, but of a more transient character.

Numerous other descriptive adjectives have been used in designating *erythemas* of different locations or from diverse causes, but those already mentioned will show how varied the etiology of this affection may be.

Stomach rashes in children, intestinal autointoxication, and various antitoxins or drugs may produce a toxemic erythema.

Treatment.—If the erythematous outbreak is of a more or less generalized distribution it is evidently caused by some internal toxemia. The diet should be carefully restricted and the intestinal tract emptied. If there is a determinable cause it should be eliminated.

Fractional doses of calomel both in adults and children will prove of use if the erythema is due to disorders of the gastro-intestinal tract, from ptomains or poisons in the intestines. A half to a teaspoonful of castor oil and spiced syrup of rhubarb is excellent in childhood or infancy.

The following lotion will prove of use:

℞—Mentholis	gr. j	0	06
Bismuthi subcarbonatis	ʒiij	12	
Glycerini	ʒj	4	
Aquæ camphoræ q. s. ad	fʒvj	180	

ERYTHEMA INTERTRIGO.

Synonyms.—Chafing; Intertrigo.

Definition.—Erythema intertrigo is a congestion caused by the friction of opposed surfaces, which may lead to an inflammation.

Symptoms.—Redness of the skin may be observed wherever two skin surfaces are in apposition, such as the junction of the upper thigh with the vulva, or scrotum, the flexures of the joints, surrounding the anal region, the neck, beneath the breasts, and the axillary region. In the beginning there is no elevation or infiltration. If the cause of the condition continues the epidermis becomes more or less macerated by the heat and moisture of the affected area, a mucoid discharge and excoriation develop, and the condition may progress to a true eczema. Secondary pus infection may supervene and a pustular outbreak occurs, also boil or abscess formation. The patient experiences a sensation of soreness, burning and slight itching.

Etiology.—The condition is observed usually in children and in infants, and fat individuals. Diapers moistened with the urinary or fecal secretions, which are not promptly changed, are frequently causative. Uncleanliness is the usual cause. The condition is usually observed during warm weather when there is increased moisture and heat of the apposed surfaces and also as the result of exercise.

Treatment.—Cleanliness is essential both as a preventive and to assist in the cure. Dusting powders have proved the most efficacious. Fuller's earth or kaolin answer the purpose admirably. Practically all of the various dusting powders are curative, such as boric acid, the bismuth preparations, talcum, or chalk. As there is burning and itching with the congestion, phenol, camphor or thymol may be added. The following preparation has proved useful:

℞—Phenolis	Mv	(0.3)
Camphoræ	gr. x	(0.6)
M. et adde.		
Bismuthi subcarbonatis	℥j	(4.0)
Acidi borici	℥ss	(2.0)
Talci Purificati	℥j	(30.0)

Lotions or ointments may be employed, but are not so efficacious.

If an eczema or dermatitis supervenes, the preparations recommended under those affections should be prescribed.

CLASS 2.

EXUDATIONES—INFLAMMATIONS.

A LARGE proportion of the diseases of the integument show inflammatory changes and could be properly placed under the heading of inflammation. Among this number are several of the erythema group which do not merely exhibit a congestion but an exudation, and, therefore, true changes in the skin of an inflammatory character, and for this reason have been placed under this classification.

ERYTHEMA MULTIFORME.

Synonym.—Erythema exudativum multiforme.

Definition.— Erythema multiforme is an acute inflammatory disease characterized by the formation of macules, papules, tubercles and at times vesicles and bullæ, which may be scattered or tend to group.

Symptoms.—The disease may be ushered in with mild malaise, rheumatic pains and slight fever. Osler has recorded cases of this affection with visceral involvement or complications of considerable severity, some with abdominal crises simulating appendicitis. In the great majority of cases the affection starts with an acute outbreak of the eruption and absolutely no constitutional or subjective symptoms.

The eruption is usually observed upon the dorsal surface of the hands and lower portion of the forearms, the tibial aspect of the legs and the face or neck. The palms and the soles in certain instances show extensive involvement. The outbreak is almost invariably of a symmetrical distribution. The lesions may be generally distributed in extensive cases. Exceptionally the mucous membranes of the mouth, the throat, the lips, the tongue, the eyelids and the nose may be attacked. The eruption usually consists of but one moderate or extensive outbreak or new efflorescences may continue to appear over a period of from five to ten days. There is a great tendency for the condition to recur. The lesions are usually of a bright pink or red color.

The most frequently observed type of outbreak consists of papules (*erythema papulatum*) of a flat character which are small to a large pea in size. A larger and deeper-seated type (*erythema*

tuberculatum) may be present, resembling the lesions found in erythema nodosum. The lesions may take the form of macules which may be grouped in the form of rings (*erythema annulare* or *erythema circinatum*). Patches of erythema may be present which exhibit sharply defined borders and only a faint redness of the center (*erythema marginatum*). Coalescence of several rings may occur and patches of a gyrated appearance are observed (*erythema gyratum*).

In addition to the usual types of eruption an outbreak may consist of vesicles (*erythema vesiculosum*) or of bullæ (*erythema bullosum*).

There is usually one predominate type of lesion present, although a few of the other varieties may be observed.

Fig. 12.—Erythema multiforme. (Courtesy of Dr. C. N. Davis.)

Erythema or *herpes iris* consists of concentric rings of vesicles or blebs of a variegated color, red, violet and purple frequently being represented. The disease usually runs a course of a few days to a few weeks.

Etiology.—The exact cause of this affection is unknown but it is probably of toxemic origin, either due to some intestinal toxin or of a bacterial nature. The disease has been attributed to the eating of stale articles of food, particularly the various sea foods. A considerable number of the milder attacks certainly seem to be of gastro-intestinal origin. The severe cases have been attributed to various microörganisms, but none have been proved as causal. The outbreak is occasionally associated with rheumatic pains and swelling of the joints. Antitoxin and various drugs, such as quinine, arsenic, belladonna, salicylic acid, potassium iodide, copaiba, some of the coal-tar group and others have been causative of an outbreak of multiform erythema.

It is more often observed during the spring and autumn months. Early adult life is more frequently attacked and the outbreak occurs more often in females. Newly arrived immigrants are more prone to an attack, or those who change their residence from the country to the city. Other factors which have been mentioned as causal are urethal irritation, uterine disturbances and a neurotic disposition.

Pathology.—According to Unna there is a vascular dilatation, a proliferation of cells especially around the vessel walls with cell emigration and edema of the cutis. In those cases showing vesicles and blebs all of the inflammatory phenomena are augmented and there is an increased flow of serum.

It is a mildly inflammatory disorder, possibly an angioneurosis, caused by organisms or toxins circulating in the blood which act centrally upon the nervous system and probably peripherally upon the bloodvessels.

Diagnosis.—The disease is to be particularly differentiated from urticaria, measles and rubella. The bullous form should be distinguished from dermatitis herpetiformis.

Erythema multiforme is distinguished from urticaria by the more lasting character of the lesions, a few hours or minutes in the one and days in the other; the reddish or reddish-blue outbreak, of a flattened macular, papular, vesicular, or bullous character as compared to the pinkish wheal with a whitish center; the predilection for certain areas as opposed to a generalized distribution; the irritability of the skin in the latter and its absence in the former; and the mild subjective symptoms in the one and not in the other.

Erythema multiforme can be readily distinguished from measles if the prodromal symptoms of the latter are considered, such as malaise, slight cough, fever, congestion and slight running from the eyes and a coryza. In the latter also a generalized blotchy eruption is present resembling slightly at the most the localized outbreak of erythema multiforme.

Rubella has to be more carefully differentiated from this condition in regard to the character of the eruption, which may resemble closely that of erythema multiforme, but the former is of a generalized distribution, although possibly fading from the face in a few hours. There may be preliminary symptoms for a day or two of feeling below par but nothing very definite, or the attack may start with slight headache, sore throat and some stiffness of the neck. The really strongest diagnostic feature is the marked glandular enlargement in rubella, particularly of the posterior cervical glands. The anterior cervical, the submaxillary and the sublingual glands may also be enlarged.

Bullous erythema multiforme can be differentiated from dermatitis herpetiformis or pemphigus easily if the duration of the disease, the character and development of the lesions, the tendency to group or confluency, the distribution, the extent of mucous membrane involvement and the subjective symptoms be considered.

Prognosis.—Erythema multiforme is an acute condition running a course usually of from a few days to a few weeks. In a few rare instances the outbreak may continue to appear over the course of some months. The disease tends to relapse in a considerable proportion of cases, usually recurring each spring, each autumn, or in certain cases both spring and autumn. After one relapse there may be no return of the affection, or the outbreak may be in abeyance for some years and then recur in the spring or fall. I have had several patients who have exhibited an outbreak both spring and autumn for the last five or six years and in one instance for ten years. Fortunately in a considerable number of cases recurrence does not occur.

Treatment.—It is a wise precaution to start these cases on divided doses of calomel, because if the outbreak is due to an intestinal toxemia the outbreak will disappear in a few days. Calcined magnesia or the saline laxatives may be used in addition.

Notwithstanding that rheumatic symptoms are absent in most instances, I have found the most reliable drug in the treatment of this affection, after the cleaning out of the intestinal tract has failed, is the salicylate of soda, in 10-gr. (0.65) doses every three or four hours. Other preparations have been suggested, such as salol, phenacetin, salicin, quinine and ergotin.

The subjective symptoms are usually very mild and therefore local treatment is not required, excepting the patient complains of itching or burning. The following, under these circumstances, will prove helpful:

℞—Resorcinolis	gr. xx	1 3
Bismuthi subcarbonatis	ʒij	8
Glycerini	fʒj	4
Aquæ hamamelidis	fʒiv	120

ERYTHEMA PERSTANS.

Erythema perstans is a disease in which scarlet or pinkish, more or less persistent patches, develop upon the face and other portions of the body surface, chiefly in children, but also in adults. When the face is attacked, the cheeks, tip of the nose, and ears show infiltrated and often gyrate patches. The red color becomes eventually of a bluish or bronzed hue. In adults small nodular lesions may occur. At all ages the erythema is due to a fibrinous inflammatory exudate associated with intense vascular injection,

the result of a toxemia which may last for a week or longer. The outbreak may persist over a period of months or years.

Wende, under the title of *Erythema figuratum perstans*, described cases observed by himself and others, in which isolated papules fading centrally and extending peripherally furnished plaques with circinate outline and often with a raised border. Confluent, gyrate, annular and other forms of outbreak occurred at times with concentric rings. In some instances the disease has lasted since early childhood.

Lenglet observed in three instances the symptoms resulting from renal insufficiency; while Kreibich observed the outbreak as a sequela of influenza-pneumonia.

In Whitfield's case the coagulation of the blood was reduced in time, and a cure was effected by the administration of calcium lactate and the exclusion of vegetable acids from the diet.

ERYTHEMA NODOSUM.

Synonym.—Dermatitis contusiformis.

Definition.—Erythema nodosum is an acute inflammatory disease of the skin characterized by the development of node-like swellings over the anterior surface of the lower legs.

Symptoms.—The disease may begin with fever, pains and swelling of the joints, some gastric disturbance and malaise. These symptoms may be entirely absent, or of a mild or severe character, and may be observed a day or a few hours before or synchronous with the appearance of the outbreak. The eruption usually appears suddenly and in the great majority of cases is limited to the tibial aspect of the legs, the arms, the forearms and other portions of the integument may be attacked. As a great rarity, according to a few observers, the mucous membrane may be the site of an outbreak.

The eruption consists of from half a dozen to twenty or thirty deep-seated nodes, which enlarge and become elevated, from a cherry to a hen's egg and larger in size. They are not sharply marginated but fade off more or less into the sound skin. The color varies from a pinkish to a bright red in the beginning and in the course of a few days they undergo all the different hues of a bruise; reddish-blue, bluish, violet, dark brown, greenish, yellowish and almost black in color. They have a tense and at times somewhat glistening appearance and are very tender to the touch and extremely painful. They are quite hard in the beginning, but soften after two or three days or longer, and fluctuation is present as if suppuration is about to occur, but absorption occurs without the breaking of the surface. The patient frequently walks with difficulty. The outbreak is usually symmetrical. The disease

runs a course of a few days to a week or more. There may be but one crop of lesions or others may appear over the course of a few days. Lesions of erythema multiforme may also be present, suggesting the possibility of the same etiological agency.

Etiology.—The disease occurs usually in childhood or early adult life, most frequently under the age of thirty. Mackenzie, in a compilation of 108 cases, found but 15 between thirty and forty years and 10 over forty years. It attacks females three to five times as frequently as males. Some observers are of the opinion that the outbreak develops in those who are anemic and weak; such has not been the experience of the writer. Although Mackenzie and a considerable number of others consider that it is associated with rheumatism, the association is absent in a considerable percentage of instances.

Erythema nodosum, the same as erythema multiforme, is probably caused by some toxemia of a nature at present unknown. It has been observed in the course of syphilis, tuberculosis, glandular fever, diphtheria, malaria and has occurred in individuals with gastro-intestinal derangement. Certain drugs, such as antipyrin and the iodides, have apparently produced an outbreak in a few instances. Endocarditis has been recorded in a few cases.

Pathology.—There are three theories as to how the lesions are produced, as to whether the disease is an angioneurosis, an inflammation of the lymphatics or due to embolism.

The nodes show a marked serous exudate in the corium and subcutaneous tissue, dilatation of the bloodvessels, lymph spaces, a cellular infiltration and an extravasation of blood and blood pigment. Some of the bloodvessels, particularly the veins, exhibit masses of leukocytes resembling white thrombi. (Unna.)

Diagnosis.—The disease has to be differentiated from bruises, abscesses, gummata, and the lesions of erythema induratum. If the acuteness of the process is taken into consideration, the number of lesions, its symmetrical character, the tenderness and pain, the association at times of articular symptoms and the fact that absorption occurs without the skin breaking, very little difficulty should be experienced. The slow course of the lesions of erythema induratum, the tuberculous nature of the patient, the dark-red color and sluggish character of the outbreak and the tendency to break down and ulcerate should give a clear distinguishing picture from erythema nodosum.

Prognosis.—As the disease in almost all instances runs an acute course, of a few days, a week or slightly longer, the prognosis is favorable. A few grave and fatal cases have been reported abroad but these were probably associated with a systemic septic infection.

Treatment.—Internal treatment should consist of thorough cleaning out of the intestinal tract, with divided doses of calomel and saline laxatives. Sodium salicylate, 10 gr. (0.65) every three or four hours for an adult or proportionately for a child, seems to hasten the cure of this condition. Quinine and sodium benzoate have also proved of value.

The most important part of the treatment, however, consists of rest of the affected part and local applications. Fomentations of a saturated solution of boric acid work admirably. The following lotion, frequently applied, has been found most useful:

℞—Ichthyolis	ʒij	8	
Acidi borici	ʒj	4	
Zinci oxidi	ʒij	8	
Glycerini	♏xl	2	6
Aquæ	q. s. ad fʒiv	120	

ERYTHEMA SCARLATINOIDES.

Synonyms.—Scarlatinoid erythema; Desquamative scarlatiniform erythema; Scarlatinoide erythema punctatum; Roseola scarlatiniforme; Dermatitis scarlatiniformis recidivans.

Definition.—Scarlatiniform erythema is a condition characterized by a more or less generalized erythema, resembling but running a different course from scarlatina, and followed by partial or complete desquamation.

Symptoms.—The disease usually begins with malaise, a chilly sensation, mild pharyngitis, and a temperature in the neighborhood of 100° F. These symptoms usually appear synchronously within a few hours or a day or two before the advent of the eruption. The outbreak develops on any portion of the body. If the face is attacked the eruption fades in a few hours or the face may be free from an outbreak. Certain portions of the integument are uninvolved or the attack is general in distribution. The color of the eruption is a bright pink or a dull or scarlet red. It frequently resembles the scarlatiniform rash of scarlet fever. Constitutional symptoms are usually extremely mild or absent, occasionally severe and the eruption intense, as in some of the French cases (*erythema scarlatiniforme desquamativum*).

Desquamation usually begins early, about the third or fourth day, and may be slight, furfuraceous, or in large thin sheets, lamellar. Exceptionally the nails may be shed and even the hair lost. The disease runs a course of a few days to three or four weeks.

Recurrences are not uncommon; relapses are usually milder than the initial attack. Schamberg has recorded an instance in an adult who had two attacks every year since infancy. A member of my immediate family has had three attacks during the last five years.

Etiology and Pathology.—The etiology is unknown; toxemias, either general or intestinal, and idiosyncrasy have been mentioned as causal. The outbreak has developed during the course of certain diseases, among which are rheumatism, pyemia, septicemia, malaria, peritonitis, ptomain poisoning, smallpox, typhoid fever, diphtheria, etc. Rashes resembling scarlatiniform erythema sometimes occur prodromal to the outbreak of varicella and measles. An erythema of a scarlatiniform type occasionally follows the ingestion of certain drugs, such as quinine, the salicylates, veronal, mercury, opium, antipyrin, copaiba, belladonna and the local dressing of wounds with iodoform. The outbreak has been observed following injuries, operations and obscure changes of tissue or secretion about wounds. Brocq considers the disease a mild form of dermatitis exfoliativa.

The theories advanced in regard to the production of the eruptive phenomena are: That it is caused by a disturbance of the nerve centers, by direct irritation of the peripheral bloodvessels or nerves, or is of reflex origin.

Diagnosis.—The disease should be differentiated from scarlatina.

Erythema Scarlatinoides.	Scarlatina.
Usually mild constitutional symptoms and at times absent.	Severe constitutional symptoms. Onset with vomiting.
Eruption frequently not generalized; outbreak at times marginated. Face frequently free or eruption on it fades within a few hours.	Eruption generalized and punctate and usually not marginated. Face attacked and outbreak on it remains for a longer period. Usually begins on face.
Tongue usually normal.	Tongue whitish, edges red and papillæ enlarged (strawberry tongue).
Fauces reddened.	Fauces swollen, tonsils enlarged and frequently show a thin, yellowish exudate.
Desquamation may be severe but starts early and terminates in a few days.	Desquamation may continue for from four to ten weeks.
Frequently history of other attacks.	Relapsing attacks of scarlet fever are rare.
Non-contagious.	Frequently history of contagion.

Prognosis.—The disease almost invariably has a favorable termination. The condition may recur.

Treatment.—The internal treatment is usually symptomatic and also depends upon any determinable cause. A saline purge is usually indicated. External treatment is rarely required. Dusting powders may be employed. Frequently the skin may be softened and exfoliation hastened by employing an ointment containing equal parts of lanolin and petrolatum.

KERATOLYSIS (DECIDUOUS SKIN).

This affection resembles closely erythema scarlatinoides in some of its features and is quite different in others. The condition

may be ushered in with mild constitutional symptoms, such as slight fever, nausea, pains in the stomach and a slight pharyngitis; frequently these are entirely absent. There may be very slight redness of the skin or its total absence. The patient shows a periodical tendency to shed the skin, the epidermis of the entire arm or leg and even the nails may be shed in one glove-like or stocking-like mass. Some of the patients have exhibited an increased sweating tendency while in others the reverse has been observed. Chevalier Preston recorded an instance where a woman shed her skin every month or six weeks from the age of seven. Frank and Sanford had a patient who shed his skin for thirty-three years, on July 24, between 3 P.M. and 9 P.M. There may be also exfoliation of the mucous membrane of the tongue and mouth. Instances of this affection have been observed by Hyde, Sangster, Crocker, Stelwagon and others. Treatment is without avail.

ERYTHEMA ELEVATUM DIUTINUM.

This title was proposed by Williams and Crocker in 1894 for a rare affection of the skin, observed chiefly in childhood, and of which but two other cases had previously been reported, by G. S. Middleton, in 1887, and by Judson Bury, in 1889.

The lesions are of a nodular character, from pea to bean size, pinkish in the early stage of the affection, and becoming in prolonged cases of a purple color. They are of a convex shape, tending to coalesce into irregular lobed infiltrations and to form raised plaques. The growths are firm on palpation and painless.

The sites of attack are the extensor aspect of the extremities, particularly over the elbows, the knees and the phalanges of the hands and feet. In extensive cases the palms, the soles, the buttocks and the ears may show involvement.

The condition in most instances persists more or less permanently but in Crocker's and White's cases involution of the lesions occurred.

Etiology.—It is a disease attacking almost exclusively the female sex and children or young adults. A history of gout or rheumatism can usually be obtained in the patient or as a family characteristic. Albuminuria has been observed in one instance (Bury).

Pathology.—The nodules are located in the corium and are apparently fibromata of inflammatory origin. According to Crocker, they are analogous to subcutaneous rheumatic nodules.

Treatment.—Treatment has been without avail, excepting in one instance where recovery occurred while the patient was taking arsenic internally and was using liquor carbonis detergens locally.

PELLAGRA.

Synonyms.—Lombardy erysipelas; Lombardy leprosy; Risipola Lombarda; Lepra Italica; La Rosa; Mal Roxo; Pellarella; Alpine scurvy; Dermatalgra; Erythema endemicum.

Definition.—Pellagra is a constitutional disease exhibiting a cutaneous outbreak which is chiefly of the exposed surfaces, gastro-intestinal and nervous symptoms.

History.—The first authentic description of the disease was made by a Spanish physician, Gaspar Casal, under the title Mal de la Rosa, in 1735. Frapoli, of Milan, in 1771, is supposed to have given the affection its present name.

FIG. 13.—Pellagra, showing marginated dermatitis.

The disease is of extensive distribution and is of an endemic character. The disorder has been extremely prevalent in Italy. In Lombardy alone the number of cases increased from 20,000 in 1770 to 104,067 in 1880. It has been estimated at the height of the endemic in northern and central Italy that 1 in every 19 of the inhabitants was assailed by the disease.

The first cases of pellagra in the United States were reported by Dr. Gray of New York, and Dr. Tyler of Massachusetts, in 1863 and 1864. Dr. Samuel Sherwell of Brooklyn, recorded 2 cases of the affection, in Italian sailors, before the American Dermatological Association in 1902. Lavinder up to the year 1909 found the occurrence of the disease in thirteen States, mostly southern.

Kerr estimated that there were 5000 individuals in the United States suffering with pellagra in the year 1909.

Symptoms.—There is a great variation in regard to the severity of the symptoms and the course of the affection. Prodromal symptoms may or may not be present and may be of short or long duration.

Prodromal symptoms consist of a certain sensation of languor and malaise, particularly in the early spring. There may be vertigo, epigastric pains, headache, loss of appetite, vague pains in various portions of the body, anorexia, intense thirst, eructation of gas, loose stools, mental dejection, hebetude, with increased tendon reflexes and incoördination of movement. These preliminary symptoms may be present for several years or only immediately precede the full-blown attack.

Pellagra is a disease of three portions of the general economy: the skin, the digestive tract and the cerebrospinal system. It is extremely difficult to make a correct diagnosis of this affection unless all three are deranged.

Skin Manifestations.—In a large majority of the cases the uncovered portions of the body alone exhibit an outbreak; therefore the eruption is usually observed upon the dorsum of the hands, wrists and portions of the face, neck and scalp. Those who carry on their occupations in bare feet and legs show the outbreak on these areas also. The fellahs of Egypt, who are almost entirely nude, present a more or less generalized cutaneous involvement. In certain instances areas which are unexposed to the actinic rays of the sun or to daylight may exhibit a typical outbreak. The outbreak is usually symmetrical and stops at the line of the clothing. The vulva may show a marked dermatitis and also the mucous membrane of the vagina. Certain typical formations of the outbreak have been observed, such as the glove-like or gauntlet patch involving the hands and the wrists, the collar-like arrangement about the neck, and the booted appearance on the foot and ankle.

The cutaneous phenomena may be divided into three stages: the first, congestion or erythema; the second, scaliness, thickening, pigmentation; and the third, a tendency to atrophic thinning. Large macular lesions first appear, of a light or dark red color, which fuse, forming a patch of dermatitis almost identical in appearance to sunburn. In from seven to fourteen days, or slightly longer, a roughened, scaly surface and desquamation are noted. Pigmentation, harshness of the surface, and a wrinkled, atrophic condition may be present. Instead of the skin having a pigmented appearance the surface may be paler in color than normally. In very acute cases moderate or marked swelling of the involved areas may be observed. The dermatitis may also consist of vesicles,

blebs, pustules, fissures and crusts. The typical pellagrous appearance consists of a mahogany color, as if the skin has been painted one or two days previously with a solution of iodine, and could hardly be mistaken for any other outbreak. There are practically no subjective symptoms.

Gastro-intestinal Symptoms.—Symptoms referable to the digestive tract are usually present in all cases and are specially observed in the severe cases. The tongue becomes swollen, denuded and is of a bright red color. In severe cases there may be more or less superficial ulceration along the edges and under the surface and yellowish sloughs may be observed which bleed easily. The lips and the cheeks may exhibit the same condition. The redness and smoothness of the tip and the edges of the tongue, in the mild cases, has been termed "bald-tongue" by Sandwith. Scrapings from the denuded areas have proved negative.

Diarrhea is usually present and is particularly severe in those cases terminating fatally. In a few instances the bowels have remained normal or constipation has been present.

Mental and Nervous Symptoms.—There are no absolutely characteristic symptoms which point toward pellagra. There is a profound mental depression, often resulting in melancholia, occasionally alternating with periods of psychic excitability. There may also be stupor and hallucinations. In rare instances epileptiform and even cataleptic seizures are observed. Only a comparatively few patients become actually insane. There is apparently, however, a greater tendency for insane patients to be attacked than the normal individual.

In the terminal stages of the disease there is a great accentuation of the symptoms; fever may now develop for the first time in the affection. There is usually profound prostration, extreme weakness because of the intestinal flux, emaciation and mild delirium. Peristalsis of the intestinal tract may cease. Opisthotonos may develop and is rather a constant occurrence in the last stage of the affection. Death usually results from exhaustion.

Etiology.—The pellagrous exanthem is evidently a local expression of a general disorder. There is no question that the actinic rays of the sun are at least partially causal in its production, combined with some general toxemia, which very probably lessens the resistance of the skin to the effect of light. Experiments have been made in exposing the hands to the sunlight protected by fenestrated gloves and the resulting dermatitis has corresponded to the unprotected areas. Daylight alone may cause the same effect.

The various theories of etiology may be subdivided into two headings: those dealing with maize or Indian corn, and those

independent of this factor. The supporters of the maize theory are commonly designated as zeists and the others as antizeists. The strongest exponent of the relationship between maize and pellagra has been Lombardo, who has studied the Italian scourge over many years.

There is a difference in the views held in regard to the relationship between corn and pellagra. It has been said that Indian corn is deficient in or lacks some nutrient principle necessary for health; that a toxic substance may be present in the maize that easily causes the disease in a susceptible individual; that the corn undergoes some form of decomposition as the result of the growth of bacteria in the intestines of certain individuals, the toxin then producing the pellagra; that toxins are produced, which are causative of the disease, by certain moulds or bacteria formed in diseased maize; that some one of the organisms which are commonly found in mouldy or spoiled maize, and which may be eaten with it, directly invades the human body where it elaborates toxins that cause pellagra.

The antizeists regard pellagra as a specific infection of the body with a parasitic organism either bacterial or protozoal in character; that the causative agent is some bacterium of unknown nature and habitat, in no way related to maize; that it is caused by an infection with some variety of amœba or other protozoön; that the etiological factor is a protozoal infection of the blood stream, which has much the same course as in malaria or trypanosomiasis (sleeping sickness). Sambon, who is one of the chief exponents of this view, believes the black fly, sand fly or buffalo gnat is the agent that carries the organism, and by biting the human host injects the protozoön into him.

Examination of the stools does not assist in regard to the etiology, although protozoa, especially amœbas and flagellates, are frequently found. The urine shows an increase in indican, and traces of albumin and casts are frequently found. The cerebrospinal fluid shows no increase of the cellular elements or albumin content and cultures have been uniformly sterile. Blood examinations show a moderate anemia and nothing characteristic in regard to the color index and the proportion of the various cells.

Experimental Studies.—Complement-fixation tests with the blood-serum of pellagrins have proved negative, as have also anaphylactic tests by the von Pirquet method.

Experiments carried out upon monkeys and other animals by the Illinois Pellagra Commission have proved uniformly negative. The animals were fed with the dejecta of human pellagrins and inoculations were made with organisms isolated from the stools of these patients. Inoculations were also made with tissue emul-

sions and body fluids. Experimental feeding with both healthy and diseased maize were likewise fruitless. Injections of maize contaminated with five different moulds were without result.

William H. Harris, however, was able to obtain positive results by inoculating filtrates from the skin, the alimentary canal, the brain and cord of a pellagrous patient into monkeys. The animals developed all of the clinical signs and symptoms together with the pathological picture discerned in the disease in man.

Pathology.—There appears to be a reaction on the part of the skin either to a local toxic irritant or an angioneurotic process influenced from a distant focus. No microörganisms were found. The stratum corneum was thickened and the other epidermic layers were normal. The upper portion of the corium, particularly the pars papillaris, showed an inflammatory infiltration of cellular elements, chiefly in the neighborhood of the bloodvessels. The connective tissue appeared edematous. Collagen showed edematous changes. The deeper portions of the corium were comparatively normal. Although the elastin was mostly normal in quantity, in certain portions of the papillary layer it was absent.

Autopsy Findings.—There is a great inconstancy in postmortem findings and nothing is characteristic of the disease because the cases examined have usually been of long standing. Brown atrophy and fatty degeneration of the liver; fatty and atrophic cardiac changes; cirrhosis of the kidney; intestinal attenuation and ulceration; hyperemia, anemia, edema of the brain, cord and meninges; symmetrical sclerosis of the cord; and acute myelitis have been found. The most constant morbid changes consist of a symmetrical sclerosis of the posterior columns of the cord, the lateral pyramidal fasciculus.

Diagnosis.—If the ensemble of symptoms is carefully considered the diagnosis of pellagra should offer very little difficulty. The one condition to be carefully distinguished is the so-called pseudo-pellagra which is observed in alcoholics with peripheral neuritis.

Prognosis.—In the cases in which the eruption appeared suddenly, with severe gastro-intestinal symptoms and marked bleb formation and ulceration, the result was usually fatal. Death may result in any attack whether it is the first or a recurrence. It may occur during the acute phase apparently from general exhaustion, or at a later period, after all the characteristic pellagrous lesions have disappeared, with symptoms of central neuritis. In the cases reported by the Illinois Pellagra Commission the death rate was 49.6 per cent. According to Hyde, the percentage of deaths from this affection in the United States is in the neighborhood of 35 per cent of those attacked.

Treatment.—Proper hygiene, good and well-prepared food, and not too much exposure to the sun's rays are important prophylactic and curative measures.

Drug treatment has not been particularly successful. Arsenic has been given by the mouth and hypodermatically. Atoxyl, quinine, strychnine, iron, and arsphenamine have all been employed.

Cole and Winthrop have used transfusion with the blood of cured pellagrous and non-pellagrous subjects, with apparent success. Symptomatic treatment is usually indicated.

ACRODYNIA.

Synonym.—Epidemic erythema.

Acrodynia is an acute infectious epidemic disease closely allied to pellagra and ergotism. Chardon gave the name to the affection, which first appeared in Paris and other French towns, as an extensive epidemic in 1828 to 1830, and has since been observed in Belgium, Mexico, Algeria, in the southern portions of Europe and America, including the West Indies, in Asia, Africa, the Philippines and the Hawaiian Islands.

Symptoms. Constitutional symptoms are observed, consisting of anorexia, nausea, vomiting, diarrhea and accompanied by swelling of the hands, the feet, the face and conjunctival injection. Subjective symptoms of formication, burning and prickling pains in the palms and soles, hyperesthesia and later anesthesia are present. An outbreak of erythematous spots appears early in the course of the affection upon the hands and the feet, particularly on the soles and palms, which may extend up the extremities and occasionally involve the trunk. Secondary desquamation, thickening and brownish appearance of the affected parts are observed. Subsequently pigmentation may supervene. The affection is unaccompanied by fever and usually runs its course in from two to four weeks. In severe instances paresis, edema of the limbs, wasting of the extremities and toxic spasms may ensue.

Etiology.—Several hypotheses as to causation have been exploited: That it is due to some defect in the food, such as altered cereals, and therefore produced by some toxin; that it is caused by transmission from one individual to another by means of a virus in the soil or clothing.

URTICARIA.

Synonyms.—Hives; Nettlerash.

Definition.—Urticaria is an inflammatory disease of the skin characterized by the development of whitish, pinkish, or reddish elevations of a transient character, which are accompanied by itching, stinging, prickling and burning.

Symptoms.—The eruption in most cases appears suddenly, with or without preceding burning or tingling, and occasionally is accompanied by slight fever. There may also be symptoms of gastro-intestinal derangement, nausea, possibly vomiting, coated tongue, loss of appetite, malaise and headache, either accompanying the outbreak or preceding it by a few hours, a day or more.

The outbreak may involve the entire cutaneous surface or certain portions of the integument exhibit a more profuse eruption. The eruption may be observed on one portion of the body, lasting from a few minutes to an hour or two, and then may appear on another portion. No part of the surface is immune to an outbreak.

The wheals differ greatly in size, varying from a split pea to an egg, occasionally being so grouped that large areas are covered, with no normal skin intervening. The lesions are of a rosy red to a whitish color, usually with a hyperemic areola. The lesions are of a transient character, frequently vanishing within a few minutes after their appearance. After the disappearance of the wheal the skin is normal in aspect. The lesions are usually of a rounded or oval shape, but rings, lines and festooned figures may appear. The skin is extremely irritable in most cases and slight irritation such as rubbing or scratching may produce fresh wheals. A blunt instrument or the finger nail drawn across the skin will often produce a raised linear wheal. The latter phenomenon is known as *autographism* or *dermographism*. The reaction of the skin to external irritation may be termed *factitious urticaria*.

The subjective symptoms of burning, itching, tickling, crawling, prickling and stinging are frequently distressing and the patient is extremely uncomfortable. The patient because of scratching and rubbing aggravates the irritability of the skin and causes an increased wheal formation.

There may be a considerable amount of swelling and edema of the affected parts, particularly the hands, the feet and the face. The patient may cause such irritation of the skin that serous effusions may develop at the summit of the wheals and flat papules may be produced.

The mucous membranes of the mouth, throat, larynx and the intestinal tract are at times attacked by wheals. Occasionally alarming symptoms are produced by the edematous swelling of the throat.

According to the size and the character of the outbreak, various descriptive titles have been applied to the condition, such as *giant urticaria, urticaria edematosa, urticaria tuberosa* and *acute circumscribed edema*. In rare instances there may be a certain amount of hemorrhage into the wheal and the condition is then termed *urticaria hemorrhagica*. This latter form should probably be

classed under purpura. In the type of urticaria in which the wheal is capped by a vesicle or bleb, the term *urticaria bullosa* or *bullous urticaria* is appleid.

Urticaria Papulosa, the *lichen urticatus* of the English, is characterized by the development of wheals, papules and vesicles, and is accompanied by intense itching. The disease almost invariably attacks children, frequently those who are poorly nourished; those of Russian-Jewish parentage are particularly prone to an

Fig. 14.—Urticaria. Wheals excited by a blunt instrument rubbed over the surface (autographism). (Courtesy of Dr. C. N. Davis.)

outbreak. The eruption is chiefly observed upon the face, the extremities and the buttocks. Small more or less typical wheals may first appear, which disappear, leaving behind persistent papules, somewhat larger than those observed in eczema. The outbreak may consist from the beginning of papules with a few interspersed wheals. Because of the intense itching the tops of the papules are scratched and excoriated and minute blood crusts are noted. The outbreak is usually more severe during the winter months and

lasts for weeks, months and sometimes years. In severe cases of long standing wheals are frequently absent and the condition then resembles markedly a mild form of prurigo, prurigo mitis, and seems occasionally to be more closely related to this affection than to urticaria.

Etiology.—Urticaria may occur at any age and in both sexes; most cases, however, are observed in early adult life and in childhood. The female sex shows a greater tendency to an outbreak. In certain instances there seems to be a hereditary predisposition to an outbreak. Although most individuals are more or less subject to an urticarial outbreak from certain articles of diet, particularly if the food is not absolutely fresh, others have a certain idiosyncrasy to foods that can be digested with impunity by the great majority. The articles which are prone to cause wheal formation are the various sea foods, such as oysters, clams, crabs, lobsters, shrimps, mussels, fish, pork, sausage, scrapple, veal, nuts, mushrooms, strawberries, cucumbers and the various canned foods. Certain individuals are unable to properly digest oatmeal, butter, potatoes and even eggs. The irritation produced by intestinal worms may cause an outbreak in children. Changes in environment and mode of living and eating not infrequently are causative factors in an outbreak, as particularly evinced by immigrants.

Any cause that produces digestive disorders or an incomplete digestion of the ingested food may become the determining factor in an outbreak. Emotional or psychic phenomenon, such as fright, anger, shock, have been mentioned as causative. Outbreaks have been observed in association with various diseases, such as malaria, jaundice, albuminuria, diabetes mellitus, and also in the rheumatic and gouty individual. Various disorders of the female generative organs are exceedingly apt to cause an outbreak.

The most plausible theory for the causation of many cases of urticaria is a toxic origin; a toxin either from without or within (autointoxication).

Wheals are not infrequently of external origin from scabies, pediculosis corporis and other animal parasites, and are produced by the bites or irritation of jelly-fish, mosquitoes, fleas, stinging nettles, caterpillars, bugs, etc. The urticarial lesions may alone be observed at the site of the bite or the irritation, or the skin may be excited in susceptible individuals to a generalized crop of wheals.

Certain medicaments cause an attack of the affection, more particularly copaiba, cubebs, chloral, turpentine, quinine, opium, the iodides, the coal-tar products, antitoxin, etc.

Pathology.—Pathological studies lead to the conclusion that urticaria is an angioneurosis due to a disturbance of the vasomotor system, probably of toxic origin. A spasm of the bloodvessels

occurs with a dilatation which gives rise to effusion, and as a result the central portion of the wheal becomes whitish by the pressure of the exudate and the surrounding portion is pinkish because of the congestion. According to Gilchrist, a true wheal is an acute inflammatory, edematous swelling, the irritating agent causing death of cells, which is followed by acute inflammatory changes. Wright and Paramore suggest that an attack of urticaria may be directly due to a diminution of the lime salts in the blood, with a consequent associated defective blood coagulability.

A wheal is a collection of semifluid material, chiefly in the upper layers of the skin. In severe instances the wheal may not only involve the derma but also the subcutaneous tissue. The epidermis is usually unaltered, but the whole corium exhibits an acute inflammatory change; the bloodvessels, particularly those in proximity to the sweat ducts, are enlarged and contain and are surrounded by a large number of polynuclear leukocytes; the lymphatic vessels and spaces are dilated. A large number of polynuclear leukocytes are also found in the papillary portion of the corium and a few in the epidermis. The corium is also swollen, containing a considerable amount of serous exudate and numerous mast cells.

Diagnosis.—Erythema multiforme is the one disease that is to be distinguished from urticaria. There should be very little difficulty in distinguishing the two affections if the symmetrical character of the outbreak, the alteration in the lesions under pressure, the lasting character of the eruption, the absence or mild character of the subjective symptoms, and the course of erythema multiforme be opposed to the lack of symmetry and more or less generalized distribution, the wheals, the intense burning and itching, and the transient character of the outbreak in urticaria. Even if bullous lesions are present, pemphigus and dermatitis herpetiformis should be easily differentiated.

Prognosis.—The acute cases of urticaria are usually easily cured in a few days. There is naturally a tendency to recurrence if the patient is again exposed to the same causative factor. Certain cases, however, run a more or less chronic course and in those instances cure is rather a difficult proposition.

Treatment.—In those cases of this affection of external origin caused by local irritation, the first indication is to determine and eliminate the cause and the second procedure is the application of an external preparation to alleviate the subjective symptoms and soothe the cutaneous irritation. If the wheals are of widespread distribution a carbolic acid lotion answers the purpose admirably; phenol, $\frac{1}{2}$ dr. (2.), acid boric, 1 dr. (4.); powdered talcum, 2 dr. (8.); and water, 4 fl. oz. (120.). If there are only a few lesions

present, an ointment will prove more healing and prolonged in its antipruritic action, therefore, menthol, gr. 2 (0.125); phenol, gr. 8 (0.6); powdered bismuth subcarbonate, dr. 2 (8.); petrolatum, dr. 6 (24.), may be applied. Internal treatment is usually not required in this type of case.

Urticaria of internal origin requires both internal and external treatment. A careful examination and history should first be obtained to determine, if possible, the source of the outbreak. Internal treatment, therefore, has to be directed to the elimination of the cause of the outbreak. As the gastro-intestinal tract is so frequently causative in the production of urticaria, the digestive channel should be our first consideration. The patient's diet should be carefully restricted, excluding all those articles which so often cause an attack, or, as an added safeguard, all food should be excluded from the dietary for at least twenty-four hours, with the exception of skimmed hot milk. The various broths, such as mutton, beef or chicken, may then be carefully added to the diet, then unskimmed milk, with a tablespoonful of lime water to each glass; later boiled rice, soft-boiled eggs, excepting in those individuals who have an idiosyncrasy in this regard; baked potato, baked apple, stewed prunes, a little of the white meat of broiled or stewed chicken, unbreaded lamb chops, beef juice, beefsteak, cup custard, junket; and from then on gradually and carefully resume the normal diet. Sea foods, canned substances, pork, sausage, scrapple, corn, tomatoes, and the various indigestible ingredients of diet should be withheld for a week or more after the subsidence of an outbreak.

In the event that the outbreak is of gastro-intestinal origin, the patient should be given a dose of castor oil, from a teaspoonful to a tablespoonful, depending upon the age of the individual. Divided doses of calomel, $\frac{1}{10}$ of a gr. (0.006), accompanied by 1 gr. of sodium bicarbonate, should be administered every half-hour until 1 gr. or $1\frac{1}{2}$ grs. (0.06 or 0.09) of the former has been ingested; followed two or three hours later by a tablespoonful of sodium phosphate, Hunyadi water, or any of the salines. If wheals still continue to appear, liquid or semiliquid diet should be continued, and a prescription containing acetanilid, 3 gr. (0.18), and sodium bicarbonate, 10 gr. (0.65), frequently proves efficacious, given every three or four hours. Sulphurous acid in 10- (0.6) to 30 minim (2.) doses, in a full glass of water, three or four times daily, frequently is curative, if administered over some days or several weeks in persistent cases. Pilocarpine hydrochlorate, $\frac{1}{48}$ (0.0013) to $\frac{1}{30}$ (0.002) gr., three or four times daily, is also very efficient in long-standing cases. The various intestinal antiseptics, such as sodium salicylate, 5 to 10 gr., (0.32 to 0.65); sodium benzoate, 10 to 20 gr. (0.65 to 1.3); salol, 5 gr. (0.32), or a few grains of charcoal-

pepsin are of use, given three or four times daily. Ergot, atropine, or the tincture of belladonna, potassium bromide, salol, strophanthus, ichthyol, strychnine, calcium chloride, arsenic, thyroid extract and the various lactic acid producing tablets or tubes have all been recommended in persistent cases. Laxatives such as Russian oil, magnesium sulphate, Pluto water, calcined magnesium should also be administered every other day, in addition to the other preparations, in long-standing cases.

External preparations are indicated to alleviate the troublesome subjective symptoms. Lotions and dusting powders prove more efficient than ointments or pastes. Either of the following preparations will prove comforting to the patient:

℞—Thymolis	gr. v	0	3
Phenolis	f℥ij	4	
Talci purificati	℥ss	15	
Glycerini	f℥iij	12	
Aquæ camphoræ	q. s. ad Oj	480	

or

℞—Phenolis	℥ss	2	
Camphoræ	℥j	4	
Mentholis	gr. vj		36
M. et adde			
Bismuthi subcarbonatis	℥ij	8	
Talci purificati	q. s. ad ℥iv	120	

URTICARIA PIGMENTOSA.

Synonyms.—Xanthelasmoidea; Urticaria perstans pigmentosa.

Definition.—Urticaria pigmentosa is a disease characterized by the development of an urticarial-like outbreak which is followed by pigmented spots, some of which are elevated and resemble new growths. The disease is of rather unusual occurrence, as but approximately 200 cases have been observed. I have seen 6 cases in ten years.

Symptoms.—The outbreak usually appears in early childhood and occurs as wheals, resembling frequently a typical attack of urticaria. Certain of the lesions persist as pigmented areas while others disappear without leaving a trace. The stain may at first be of a reddish to a reddish-brown hue, and later becomes of a yellowish-brown or brown color. The pigmented areas may be macular, even with the skin surface or elevated, of a papular aspect or exceptionally resembling a keloid. Some of the lesions bear a marked resemblance to the yellowish patches of xanthoma.

The lesions may be soft to the touch or somewhat firm, and vary from pea to hazel-nut in size. The surface of some may be distinctly rough, "chagrinated," as called by Raymond. The covered portions of the body usually show the most abundant

outbreak, although the face, neck and even the scalp may exhibit the lesions in severe and extensive instances. There may be very few or numerous lesions. The outbreak may continue to appear over months or many years. After a short or considerable period, wheals appear in lessened numbers or the tendency to wheal formation ceases. The pigmented areas, however, tend to persist

Fig. 15.—Urticaria pigmentosa. Girl, aged two years. Duration since three months of age.

indefinitely. The skin is very irritable, and wheal formation can be excited by rubbing or with a blunt instrument (autographism). Itching may be a marked symptom, only slightly present, or absent. The buccal mucous membranes in exceptional instances show pigmented spots.

Etiology.—Urticaria pigmentosa is very rarely congenital but usually starts at a very early age. More than half of the reported

cases were observed at or before the age of six months. The disease had its beginning in the first year of life in between 70 and 80 per cent of cases. The 5 cases of the writer developed within a few months after birth, at three months, four, six, and ten years respectively. Males have been more frequently attacked than females. The affection usually appears in singularly healthy individuals. Those of a blond type are more apt to be attacked than brunettes.

The affection has exceptionally followed vaccination, varicella, measles, severe fright, insect bites (Hutchinson), after a sulphur bath, and maternal shock during pregnancy. Paramore considers that the disease occupies an intermediate position between various purpuric conditions and the urticarias, because he found certain modifications in the red-blood cells toward destructive agents and increased salt contents of the blood. A toxemic origin and also a congenital condition closely related to the nævus group have been suggested.

The predisposing or essential causes of the affection are unknown. The various etiological factors quoted above are as yet to be proved.

Pathology.—The diagnostic features are the presence of large numbers of mast cells and the increase of pigment in the skin. The mast cells are arranged in masses, and columns in the papillary and subpapillary portions of the corium, following the course of the bloodvessels; around the hair shafts, particularly in the neighborhood of the hair papillæ, the sweat glands, and the sweat ducts. The bloodvessels are dilated.

The epidermis is normal excepting for the stretching and flattening, depending upon the size of the papule or wheal that may be present and for the increased amount of pigment. The latter is found in the prickle-cell layer, and also free in the corium. There may be intra- and intercellular edema of the epidermis. Keratohyaline may be deficient. The granules of pigment are composed of melanin.

Diagnosis.—The various features mentioned make the differentiation distinct from either xanthoma multiplex, which is without wheal formation, and from urticaria, which is not followed by pigmented areas.

Prognosis.—Amelioration of the itching and a lessening or subsidence of the wheal formation can usually be accomplished. The skin is apt to remain irritable and easily excited to wheal formation, although the tendency to spontaneous lesions may disappear. The pigmented areas usually persist throughout life or for many years. The color in certain instances become somewhat lighter in shade, but total disappearance does not, or rarely occurs. There

seems in some cases at least a tendency for the affection to be less pronounced as puberty or adult age is reached.

Treatment.—Internal medication is frequently disappointing or has to be given over a considerable period to affect much change in the actively appearing wheals. The same careful dietetic regimen should be instituted as suggested under urticaria to avoid digestive disturbances, although the gastro-intestinal tract has not been proved in any way causal. The internal remedies usually employed are the various laxatives mentioned under urticaria and eczema, and the salicylate of soda, pilocarpin, belladonna, thyroid, and arsenic. Of these the salicylate of soda has proved of some benefit, in from 1 to 10 gr. doses (0.06 to 0.65) three or four times daily.

Locally antipruritic preparations should be employed; dusting powders and lotions are suggested. As efficacious as any is the following:

℞—Thymolis	gr. ⅛	0	008
Phenolis	♏v		32
Camphoræ	gr. x		65
M. et adde			
Sodii salicylatis	gr. v		32
Acidi borici	ʒss	2	
Talci purificati	q. s. ad ʒj	30	

ANGIONEUROTIC EDEMA.

Synonyms.—Giant urticaria; Acute non-inflammatory edema; Acute circumscribed edema; Edema circumscriptum; Edema cutis circumscriptum acutum.

Definition.—An inflammatory disease characterized by the development of acute circumscribed edematous swellings of large size. Although Quincke has been given credit for the description of the affection, the condition was in reality originally reported by Bannister.

Symptoms.—The affection is characterized by an attack of one or more giant wheals, which appear suddenly and usually reach their full size in a few seconds, a minute or slightly longer. The eyelid, lip, and the ear lobe are the most frequent sites of outbreak. Collins collected and tabulated 71 cases of the affection. The face showed involvement in 29, the extremities in 22, the trunk in 6, the larynx in 5, the genitalia in 3, the stomach in 3, the gums and palate in 1, the neck in 1, and the mastoid region in 1. The tongue may be greatly swollen; the affection attacking the pharynx may be mistaken for an abscess. Dyspnea may be an alarming symptom when the larynx is attacked. The brain rarely is attacked by this form of circumscribed edema. The scrotum at times shows a marked involvement.

Although the swelling is usually enormous, it may be slight. The wheal may be of the normal color of the skin, somewhat paler, of a pinkish or reddish hue; it is hard and does not pit like ordinary edema. The swelling may disappear as rapidly as it appeared; may last a few hours, days, one or two weeks. The tendency for new lesions to appear at times continues for days, weeks, and exceptionally for months or years. There is a tendency for the attack to recur. The attack may be accompanied by severe burning and itching. Urticaria of the usual type of lesions may be associated with the giant wheals.

Etiology and Pathology.—Acute circumscribed edema is of an angioneurotic origin; a vasomotor neurosis. Probably a toxin acts upon the central nervous system and causes the outbreak. It is closely related to urticaria. The affection usually occurs in early or young adult life, in either sex, and in certain instances there is a family tendency. Gastro-intestinal toxins caused by certain articles of diet are apparently causal. Malaria, autointoxication, trauma, draughts, sudden cooling of the surface, albuminuria, and hemoglobinuria have all been cited as causative.

Diagnosis.—The more or less transitory character of the lesions, their hardness, lack of pitting, distribution, and the course and history of the affection should readily exclude edema and all other conditions.

Prognosis.—The affection usually runs a favorable course to recovery. A fatal termination has occurred in a few instances in which the larynx and glottis have been attacked. The condition tends to recur.

Treatment.—The same treatment applies in this disease as has been mentioned under the treatment of urticaria.

PITYRIASIS ROSEA.

Synonyms.—Pityriasis maculata et circinata (Bazin); Herpes tonsurans maculosus. (Hebra.)

Definition.—Pityriasis rosea is an inflammatory disease which runs a more or less self-limited course, and is characterized by superficial, macular, and circinate lesions, of a pinkish color and with a slightly scaly fawn-colored center, attacking chiefly the trunk and upper portion of the extremities.

Symptoms.—The disease may be ushered in with mild fever, slight swelling of the submaxillary glands and those of the neck, possibly enlargement of other glands, and occasionally slight pharyngitis. In most instances, however, there are no constitutional symptoms either preceding or accompanying the outbreak. Three or four days to a week or ten days before the appearance of the

eruption, one large patch, varying in size from a quarter to a silver dollar, appears on the trunk, usually on the lateral portion. This lesion is somewhat thicker, although superficial, than the subsequent outbreak; it is annular, of a pinkish to a pinkish-red color, and has a fawn-colored slightly scaly center. The remainder of the outbreak develops more or less simultaneously, all of the lesions appearing in a day, two or three days, or within a week. The outbreak occurs as pinhead-sized pinkish spots which increase

Fig. 16.—Pityriasis rosea.

in size, or as small annular salmon-colored plaques with a fawn-shaded center. The latter lesions are rarely larger than a quarter-dollar and are usually of dime size or smaller in dimensions. They are extremely superficial and practically no infiltration can be felt by the finger in drawing it across the surface. Although some of the lesions may become confluent, the majority remain discrete. Itching may be absent, at times it is moderately present, and in certain instances the pruritus is severe.

The outbreak in the great majority of cases is strictly limited to the trunk, or to the trunk and upper portion of the extremities. The forearms and the lower portion of the legs may exceptionally be attacked. The face, the hands, and the feet are rarely involved. The disease usually runs a course of from three to six weeks; at times of shorter duration and exceptionally lasting for a somewhat longer period. Recurrences are rare.

Etiology.—The disease is of comparatively infrequent occurrence and has a tendency to appear in early adult life. The cause is unknown, but eventually it will probably be proved to be of toxic or parasitic origin.

Pathology.—The Austrian dermatologists believe that the disease is caused by the ringworm fungus, but practically all other authorities are a unit in their disbelief of this causative factor.

The disease shows an extremely mild inflammation of the papillary and subpapillary portions of the cutis, dilatation of the vessels, perivascular cell infiltration, and edema. Later in the affection minute vesicles form beneath the horny layer of the epidermis.

Diagnosis.—The disease is to be differentiated from seborrheic dermatitis, tinea circinata, psoriasis, and maculo-papular squamous syphiloderm.

Seborrheic dermatitis is located upon the scalp, the alæ of the nose, the eyebrows, in the armpits, on the pubic region, over the sternum, and the interscapular region. The patches are thicker than in pityriasis rosea, and are covered with a greasy yellow scale. The affection runs a longer course.

Tinea circinata rarely shows such a large number of lesions. The patches exhibit a raised circumference, which is occasionally papular or papulo-vesicular, and there is a greater central clearing. The lesions are more infiltrated. There is a greater tendency for the lesions to attack the face and the hands. Scrapings show, microscopically, the ringworm fungus.

Psoriasis is of more or less general distribution, with a great tendency to involve the scalp and the extensor surface of the extremities. The patches are sharply marginated, infiltrated, reddish in color, and are covered with a thick silver-white scale. The disease runs a chronic course.

The maculo-papular syphiloderm is of a generalized distribution, including the face, the hands and the feet, particularly the palms and the soles. The lesions are usually in plaques with no central clearing, of a dark red or ham color. The concomitant symptoms of the disease are present.

Prognosis.—The disease tends to disappear spontaneously without leaving a trace. The condition does not recur.

Treatment.—There is no indication for internal treatment, as the condition is not affected by any known drug. Symptomatic treatment should naturally be instituted in the event that there is any derangement of the patient's health.

External treatment apparently hastens a cure in certain instances. Lotions do not prove so efficacious as ointments or pastes. If the outbreak is marked, extensive in distribution, and there is a considerable amount of itching, a phenol lotion containing a small amount of glycerin may be applied: phenol, 2 dr. (8.), glycerin, 3 dr. (12.), water 1 pint (480.). Although precipitated sulphur ½ dr. (2.), salicylic acid, 10 gr. (0.65), to the ounce (30.) of petrolatum or benzoinated lard have proved beneficial when used by some dermatologists, the following has proved the most efficient in my hands:

℞—Phenolis	ʒss	2	
Camphoræ	gr. xl	2	6
M. et adde.			
Acidi borici	ʒiss	6	
Bismuthi subcarbonatis	ʒj	30	
Petrolati q. s. ad	ʒiv	120	
M. Ft. ung.			

In cases in which there are not very many lesions present the following proves of benefit:

℞—Mentholis	gr. viij		5
Phenolis	ʒss	2	
Camphoræ	ʒj	4	
M. et adde.			
Hydrarg. chloridi mitis	gr. xl	2	6
Pulv. amyli, Bismuthi subcarbonatis āā	ʒj	30	
Petroli q. s. ad	ʒiv	120	
M. Ft. ung.			

Dusting powders may be applied; phenol, thymol, and camphor being used for the itching, made up in powdered starch, zinc oxide, bismuth and talcum. Water and soap are not contraindicated.

DERMATITIS EXFOLIATIVA.

Synonyms.—Pityriasis rubra; General exfoliative dermatitis; Acute general dermatitis.

Definition.—Dermatitis exfoliativa is a generalized, exceptionally limited, inflammatory disease characterized by redness and abundant flaky desquamation.

There is great confusion at the present time as to exactly what conditions should be placed under the heading of exfoliative der-

matitis. As certain cases of dermatitis exfoliativa resemble very closely classic instances of *pityriasis rubra* it has been decided best to place both under the above heading. Two divisions of the subject, however, have been made; the first, to include all instances of dermatoses, acute or subacute in type, accompanied by generalized and extensive exfoliation of scales; and the second, comprising only the cases of pityriasis rubra of the Hebra variety.

Symptoms.—The disease may be of primary occurrence or follow an attack of eczema or psoriasis. The condition may be preceded by a feeling of depression or debility, a distinct chill or chilliness, sometimes vomiting and fever, or may start suddenly with no constitutional symptoms. The eruption is of sudden occurrence, and consists of either a diffused redness, which spreads over the cutaneous surface and soon becomes scaly, or there is the development of very slightly elevated, well-defined red patches which become confluent and are soon covered by a scale.

The eruption spreads rapidly at the edges of the lesions and joins with other areas until the entire surface is covered, the process taking from a few days to some weeks. The entire surface is eventually of a bright or dark red color and covered with scales. There is a profuse shedding of these scales. The skin is but slightly infiltrated in the early stage and later to a greater degree. The epidermis of the palms and the soles may be shed *en masse*. There may also be a loss of the hair and nails. Itching and burning may be present. The affection at times runs an acute course but usually progresses over months or years; recurrences are frequent. Exceptionally the outbreak is limited to certain portions of the body, particularly the hands and the feet.

Pityriasis rubra, as described by Hebra, might be termed an unusually severe form of dermatitis exfoliativa. The condition is more apt to start with constitutional symptoms; the skin exhibits practically no infiltration, or if any, very slight; the scales are smaller and finer. The disease persists for months or years, increasing in severity as it progresses. Later in the disease there is the sensation of chilliness, shedding of the hair and the nails, adenopathy, atrophy of the skin, and ulceration. Late in the malady, fever, pneumonia, colliquative diarrhea, tuberculosis, subcutaneous abscesses, bed-sores, and even gangrene of the skin may supervene. The tongue may be bright red in the early stage and later be covered with a brownish crust; occasional exfoliation is noticed. Sweat secretion may be lessened in certain areas and increased in others.

Etiology.—The exact cause of the affection is unknown. Various toxemias have been mentioned as causal. The outbreak may be associated with such diseases as gout, rheumatism, tuberculosis, chronic alcoholism, anemias, cachexia, central and peripheral

neuroses. The affection has been attributed to climatic conditions, particularly during the autumn. The ingestion, injections, and local application of certain drugs have produced an outbreak, or a closely analogous condition, particularly quinine, arsenic, antipyrin, and the various antitoxin sera. Men are more frequently attacked than females and children than adults.

The type described by Hebra has been attributed to certain visceral derangements which had not been recognized at the appearance of the eruption.

Pathology.—The skin shows an inflammation, including thickening of the horny and the granular layers, edema of the rete, a plastic exudate in the upper portion of the corium, dilated bloodvessels, absence of mast cells, and an abundant cell infiltration.

The *Hebra type* shows the same, only an accentuated pathological change, and in addition the rete pegs are elongated; the connective tissue beneath the infiltrated areas is hypertrophied and sclerotic and also the presence of numerous cells, resembling mast cells. According to Tschlenow, the primary changes occur in the epidermis, and a secondary inflammation is observed in the cutis leading to atrophy of the skin.

Diagnosis.—The disease has to be particularly distinguished from psoriasis and eczema. Psoriasis usually is not of such a universal distribution; the skin is thick and infiltrated, and there is a thick silvery-white scale; the palms and the soles are almost always unattacked, and there are no constitutional symptoms and exfoliation of the epidermis. In eczema of a universal distribution the skin is thick and infiltrated; there is intense itching and frequently oozing in addition to the dry outbreak; constitutional symptoms are usually absent or mild. Lichen planus is practically never of a generalized type, and even in extensive instances, typical, irregularly shaped, violaceous papules may be found. The absence of marked constitutional symptoms in the early stage, the lack of the strawberry tongue, pharyngitis, the chronic course of the affection, exclude scarlet fever. In the early stage it is at times somewhat difficult to differentiate erythema scarlatinoides, but the short course of the latter, the erythematous character of the outbreak and the tendency to desquamation in large sheets assist in the diagnosis. Pemphigus foliaceous can be distinguished because of the bullous formation.

Prognosis. In a considerable number of cases the patients recover, although convalescence may be prolonged by frequent relapses. Cases of generalized distribution, particularly those with constitutional symptoms, rarely recover. In protracted cases the general health of the patient suffers and there is usually a fatal termination. In the Hebra type of pityriasis rubra the

PLATE II

Dermatitis Exfoliativa.

(Courtesy of Dr. M. B. Hartzell.)

result is almost invariably fatal; of the 21 cases of this affection observed by Hebra and Kaposi, 20 died.

Treatment.—Internal or external treatment frequently seems to have very little effect in determining the course of the affection. Any possible causative factor should be eliminated, the health should be raised to its highest point, and the gastro-intestinal tract carefully studied. Pilocarpin, sodium salicylate, carbolic acid, and arsenic have been employed without much avail. Quinine, as recommended by Mook, has proved the most efficient of the internal remedies. The latter drug has to be given in very large doses, from 30 to 80 (2. to 5.) gr., are administered daily.

External treatment makes the patient feel more comfortable, and therefore should be applied. The milder preparations usually prove the most comforting: carbolized petrolatum, olive oil, or oil of sweet almonds. C. J. White, of Boston, recommends dusting powders locally, which are uncomfortable but efficacious. The following dusting powder and paste have proved efficient:

℞—Thymolis	gr. j	06
Phenolis	♏xx	1 3
Camphoræ	gr. xl	2 6
M. et adde		
Acidi borici	ʒiss	6
Talci purificati	ʒiv	120
M.		
℞—Phenolis	ʒss	2
Camphoræ	gr. xl	2 6
M. et adde		
Acidi borici	gr. lxxx	5
Bismuthi subcarbonatis	ʒj	30
Petrolati	q. s. ad ʒiv	120

DERMATITIS EXFOLIATIVA EPIDEMICA.

Synonyms.—Epidemic skin disease; Savill's disease.

Savill first described, in 1891, a disease which occurred in London institutions, resembling both a dermatitis exfoliativa and an eczema. It attacked, however, several individuals simultaneously or rapidly after each other, and ended fatally in from 5 to 13 per cent of the cases. Several attendants caring for the cases developed the affection. Patients are usually of advanced age and males are more prone to an outbreak. The disease has usually occurred during the summer months and frequently without constitutional symptoms. In certain instances, however, anorexia, vomiting, diarrhea, and sore throat may precede or accompany an outbreak.

The eruption appears as erythematous patches or papules, of a bright-red or crimson hue, generally on several regions, and at

times accompanied by itching. Vesiculation may also be observed. An extensive surface is attacked by the confluence of the various patches. The outbreak usually starts upon the face, the scalp and the arms. Some infiltration of the skin may be present and exfoliation occurs either in sheets or is of a bran-like character.

Savill divided the disease into the papulo-erythematous stage, lasting from three to eight weeks; an exudative stage of from three to eight weeks; and a subsiding stage.

The cervical and postoccipital lymphatic glands are frequently enlarged and conjunctivitis is apt to be present. The hair and nails may be shed. At the height of the disease symptoms of malaise, anorexia, prostration, at times albuminuria, and, in certain instances, diarrhea may be present. In fatal cases, tremor, muscular spasm, labored breathing, intestinal disturbance, cardiac weakness, pulmonary complication, and a marasmatic condition are observed. Convalescence is slow and relapses are frequent.

Russell and Savill isolated a diplococcus which they consider causal. Echeverria determined a peculiar degeneration in the nuclei of the prickle cells.

Treatment.—Treatment seemed to have no effect on the course of the affection. The local antipruritic preparations mentioned under dermatitis exfoliativa may be applied for the itching.

DERMATITIS EXFOLIATIVA NEONATORUM.

Synonyms.—Ritter's disease; Dermatitis exfoliativa infantum; Keratolysis neonatorum.

Ritter has described a rare exfoliative disease of the skin which develops in nursing infants from six days to five weeks of age, and is chiefly observed in foundling asylums.

Symptoms.—The disorder is characterized by the development of a reddened exfoliating patch, most frequently on the lower part of the face, though it may appear on any portion of the body, and spreads rapidly until the entire cutaneous surface is reddened and exfoliating. The surface is usually dry, at times moist, and occasionally a few vesicles and bullæ are present. The angles of the mouth and other mucous surfaces may exhibit fissures and crusts. The mucous membranes of the mouth, the nose and conjunctiva are involved. Because of the pruritus, excoriations are present. There are usually no constitutional symptoms, and complete involution occurs in from seven to ten days. Recurrences are infrequent. In severe instances the affection lasts a month or more, and there are symptoms of gastro-intestinal derangements, and marasmus.

Etiology and Pathology.—The cause of the affection is unknown. Some authorities consider it is a malignant form of pemphigus of infants, but the majority believe the conditions are unrelated. A septic origin has been suggested by Ritter. Kaposi considers it is only an exaggerated form of the normal exfoliation of the newborn. Histological examinations show a superficial inflammation, with exudation, and exfoliation of the epidermis.

Prognosis.—The prognosis is unfavorable, as the mortality is about 50 per cent.

Treatment.—Supportive measures should be instituted. The patient has to be treated symptomatically. Olive oil should be employed as a local emollient.

PRURIGO.

Synonyms.—Prurigo gravis; Prurigo ferox; Prurigo agria; Prurigo mitis.

Definition.—Prurigo is a chronic inflammatory disease of the skin, usually beginning in early life, and characterized by the presence of papules, chiefly on the extensor surfaces, and accompanied by severe itching. Hebra originally named the disease, which is usually found in Austria, rarely in America, and frequently attacks the Hebrew race, of the male sex.

Symptoms.—The affection may be either of a mild (*prurigo mitis*) or severe form (*prurigo ferox, prurigo agria*). In the early stage of the disease wheals and papules of the typical urticaria type are present, and may continue to develop, sparsely, even after the patient has been attacked by the characteristic prurigo lesions. The diagnostic lesions are pinhead-sized papules of a pale-red or white color, which increase somewhat in size and become of a deeper shade of red as the disease progresses. Because of the intense itching, many of the papules are excoriated by scratching, and blood crusts are then found upon the summit of the lesions.

The disease is most marked upon the extensor surfaces, particularly on the lower legs, and the buttocks. In the milder cases the outbreak is almost exclusively limited to these areas, and the lesions are comparatively few in number. In severe instances the eruption may be more or less generalized; the trunk and the flexure surfaces show the least involvement. Although the face is rather frequently attacked, the scalp is rarely the site of an outbreak. The palms and the soles are usually involved, while the axillæ and popliteal spaces are apt to be normal. The skin becomes dry, and the involved surface is thickened, hard, rough, and exhibits branny scaliness.

There is enlargement of the superficial lymphatic glands, especially

the inguinal. Scars of a superficial character may result from the scratching, and the irritation results in pigmentation. Secondary pus infection may result from the same cause. The affection is worse during the winter months.

Etiology.—Those attacked by the disease are usually poorly nourished and are in bad hygienic surroundings. Neuroses, toxemias, or parasites have been mentioned as causal, particularly the first. Climatic conditions apparently influence somewhat an outbreak.

Pathology.—According to Kaposi, the anatomical picture is indistinguishable from that found in severe forms of papular eczema, or from other forms of chronic dermatitis. There is a proliferation and swelling of the rete cells, and edema and cellular infiltration of the papillæ, chiefly surrounding the bloodvessels, and also dilated lymph spaces.

Diagnosis.—Prurigo should scarcely be considered, in America, in making a diagnosis, as it is extremely rare. The disease most closely resembling prurigo is papular eczema. The latter should be readily distinguished by the location of the outbreak, the course of the affection, by the age of development, the extent of the eruption, by the uniformity in the type of the lesions, and by the response to treatment.

Pruritus can be easily differentiated because of the lack of eruption.

Pediculosis corporis has the diagnostic parasite, which can be found in the underclothes or on the surface of the body. The face is always free. The itching is most severe on removing the clothes. The eruption consists of long linear scratch marks and punctate hemorrhages, and no papules are present. The outbreak is also observed on the upper portions of the extensor surfaces instead of the lower, and chiefly across the shoulders.

Scabies has the characteristic burrow on the fingers. The flexure surface is the site of attack rather than the extensor, and the itching is practically only at night.

Urticaria only resembles prurigo in the early stages.

Prognosis and Treatment.—Cure is rarely effected in severe cases although betterment can be promised. Cure is usually effected in the milder cases, but prolonged treatment has to be carried out. The few cases observed in this country have been greatly improved or cured because of the different climate, better nourishment, and hygienic conditions.

Treatment consists of plenty of good, nourishing food, hygienic surroundings, and tonics. Cod-liver oil is frequently beneficial in these cases; the syrup of the iodide of iron, other iron preparations, strychnine or nux vomica, quinine and arsenic. Carbolic acid, pilocarpin, and thyroid extract have also been employed. As

constipation is not infrequently present, divided doses of calomel, aromatic syrup of rhubarb, and castor oil are frequently indicated.

The various medicated baths, such as sodium hyposulphite, 2 to 4 quarts to the bath, are of use. Kaposi recommended a beta-naphtol ointment, 10 gr. (0.65) to the ounce for a child and 25 gr. (1.6) to the ounce (30.) for an adult, and in addition every other day a warm bath and plenty of naphtol-sulphur soap is employed. Green soap or the tincture of green soap is used in bathing chronic cases. Strong salicylic acid ointment, 20 to 60 gr. (1.3 to 4.) to the ounce, may also be employed. In milder cases an antipruritic ointment containing 2 gr. (0.13) of menthol, phenol 8 gr. (0.5), salicylic acid 10 gr. (0.65) to the ounce (30.) of petrolatum is of use. Liquor carbonis detergens in either an ointment or lotion and from ½ to 1 dr. (2. to 4.) to the ounce (30.) is frequently useful. The following may be employed:

℞—Liq. carbonis detergentis	. . . . .	ʒiij	12
Zinci oxidi	. . . . .	ʒij	8
Glycerini	. . . . .	ʒj	4
Aquæ camphoræ	. . . . . q. s. ad	ʒiv	120

M.

PRURIGO NODULARIS.

Synonyms.—Multiple tumors of the skin accompanied by intense pruritus.

Hardaway and Heizmann, Schamberg and Hirschler, Hyde, Jackson and Johnston and others have reported cases of this rare disease of the skin, which is characterized by the appearance of numerous firm pea- to finger-nail-sized nodules upon the back, but chiefly on the extremities; the hands, the feet, a few on the soles, the legs, and the thighs. They are of a whitish, pinkish, or brownish (blackish in the negro cases) color, smooth in the beginning and later rough, horny, or verrucous. The itching was severe but limited to the affected areas. As the result of scratching the surface of the nodules became fissured and in certain instances hemorrhagic. Confluence of the lesions into an infiltrated plaque is occasionally observed, but they usually remain isolated. The attack begins as dry papules, but in one case "blisters" were present.

There is thickening of the horny layer of the epidermis and fusiform cells are present in the deeper strata. Cell nests and cell columns are observed in the neighborhood of the bloodvessels in the corium. The vascular channels are dilated.

The disease is of long duration; the lesions have remained without change for from fifteen to twenty years in the reported cases.

Treatment.—Treatment has been ineffective; apparently nothing has caused improvement or cure.

LICHEN PLANUS.

Synonyms.—Lichen ruber planus; Lichen psoriasis.

Definition.—Lichen planus is an inflammatory disease of the skin, characterized by the development of pin-head to small pea-sized, flat, violaceous, irregularly shaped papules, often with a central depression, and of a discrete or confluent arrangement. Erasmus Wilson first described the affection.

Symptoms.—Lichen planus may be acute or chronic, and localized or of a generalized distribution. The areas of predilection are the flexure surface of the wrists, the forearms, the ankles, and the lower legs. In extensive cases there may be numerous lesions on both surfaces of the extremities and scattered over the trunk. The face and scalp, palms and soles are rarely attacked. The nails are exceptionally involved, resembling the condition found in eczema or psoriasis.

The characteristic lesion is a pin-head to pea-sized, slightly elevated, flat papule, the base of which is irregular or angular in shape, and with an umbilicated, shiny surface, at times covered with a fine glistening scale. The minute lesion in the beginning is of a reddish color, but as it grows to maturity it becomes of a reddish-violet to a violet-purple color. The lesions may remain discrete, but tend in extensive cases to form large confluent patches, of a violaceous hue, and covered with fine glistening silvery scales. Minute grayish or whitish points or lines can be distinguished upon the surface of some of the papules. The lesions occasionally by their confluence form rings (*lichen planus annularis*), lines (*lichen planus linearis*), gyrated and festoon-shaped figures.

The lesion on the lower extremities are of a deeper hue, a purple color, than elsewhere. The papules may become the size of a pea or bean and larger on the lower legs, at times with a rounded base, and occasionally with a roughened surface (*lichen obtusus; lichen planus hypertrophicus*), or a wart-like summit (*lichen planus verrucosa*). Cases have been reported in which numerous node-like masses of a linear and band-like arrangement, resembling a necklace of beads, with rounded, punctiform papules, and interspersed macules of a sepia tint have been present (*lichen ruber moniliformis*).

Vesicles and bullæ have been observed as rare accompaniments of lichen planus, most frequently in those who have been taking arsenic. Crocker has reported 2 cases in which the papules were of a deep-crimson color, soft to the touch, and obliterated temporarily by pressure (*lichen planus erythematosus*).

The disease runs a chronic course lasting, untreated, for months or years; the original lesions persist or new papules appear. Recur-

rences are exceptional rather than the rule. Rarely lichen planus may begin as an acute outbreak, becoming generalized within a day or slightly longer. The lesions are then observed to be extremely small, of a bright red color, and have no particular tendency to group. Fever, mild or severe, and systemic symptoms may be present, and an associated pemphigus, diabetes, syphilis, and grave ulceration. Acute attacks may develop in those who have not previously experienced an outbreak of lichen planus, but are more apt to occur in individuals who have had previously a few papules, at least, of the affection. The acute type of the disease may yield readily to treatment or persist as a localized or a generalized outbreak of the chronic type.

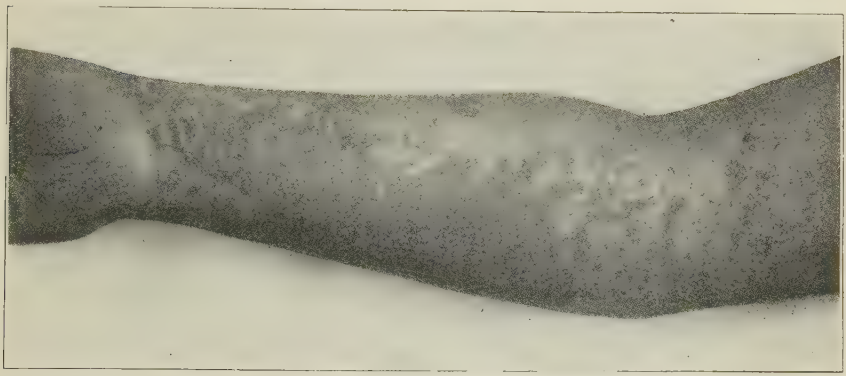


FIG. 17.—Lichen planus. (Fox.)

The lichen planus not infrequently attacks the mucous membrane of the mouth, chiefly the inner surface of the cheeks, occasionally the tongue, usually synchronous with the cutaneous outbreak, but at times preceding the same; rarely being alone the site of involvement. The lesions consist of white, whitish-lilac, and grayish color dots; practically non-elevated papules, plaques or streaks; resembling markedly the appearance immediately after a cauterization with the nitrate of silver. Rarely rings may be present on the mucous membrane of the cheek, as in a case recently shown by the writer before the American Dermatological Association.

The glans penis may show an outbreak of papules, in some instances having a ring formation. They are of a grayish-white color and occasionally precede the cutaneous outbreak. Both the outer and inner portion of the vulva are occasionally attacked.

Subjective symptoms consist of burning and itching, the former usually slight and the latter frequently severe.

Etiology.—The disease is not frequent. Less than 1 per cent of our cases are of lichen planus. The condition occurs in both sexes during active adult life chiefly, and rarely in childhood. I have seen one case in a girl, aged six years. It is usually found in private rather than in hospital practice, patients frequently being of a nervous temperament. Overwork, worry, anxiety, nervous shock, and exhaustive conditions tend to cause an outbreak in those predisposed. It occasionally follows the course of nerves and nerve injury. Traumatism, digestive disturbances, malaria, malnutrition, and disease of the generative organs have all been cited as causal. Diabetes was recorded in one instance. It has been suggested that as lesions develop in the course of scratch marks the disease is caused by traumatism following some disturbance of the nervous system (Jacquet); others take the traumatic origin of the lesions as the evidence of the parasitic nature of the affection (Hallopeau and Jomier).

Pathology.—The corium shows a sharply marginated pathological change, limited to the papillæ and the subpapillary layer, consisting of dilated vessels, edema, and a cellular infiltration. The latter are either leukocytes or of connective-tissue origin. The rete primarily exhibits hyperplasia and intercellular edema and secondarily thinning.

Diagnosis.—The disease should be distinguished from papular eczema, psoriasis, the papular syphiloderm, and the hypertrophic cases of the lower extremities, from multiple idiopathic pigmented sarcoma of Kaposi. Papular eczema has not the characteristic distribution, the irregularly based, flat-topped, shiny, violaceous papules, umbilicated and with a fine scale, as are found in lichen planus, but the lesions are of a red color, more acuminated, and usually areas of moisture or oozing are present. Squamous eczema has a different kind of scale. The violet color and shiny appearance are absent and the distribution and course of the affection are entirely different. In papular syphiloderm, concomitant symptoms of the disease are present, the papules are not flattened when of the small type, nor pruritic, and they run an entirely different course. In the sarcoma of Kaposi the leg is enlarged, the lesions are infiltrated, and the characteristic nodules are of an entirely different character than found in hypertrophic lichen planus.

Treatment.—As the patient's general health is occasionally impaired or there are signs of nerve exhaustion, the first indication is plenty of rest, long hours in bed, sufficient good, nourishing food, and, so far as it is possible, the throwing off of worries and care. Frequently a change of scene and climate are advantageous. The general tone has to be raised in certain cases by the administration of cod-liver oil, iron, quinine, the mineral acids, and nux vomica.

Gastro-intestinal disorders have to be treated according to the symptoms present.

Certain internal preparations have a marked effect in limiting the production of new lesions and causing the disappearance of the old. The most important remedies in this regard are arsenic, mercury, salicin, and the salicylates, the latter two proving more beneficial in the acute cases. Arsenic is given in the form of the solution of the arsenite of soda or of Fowler's solution, or arsenious acid, in ascending doses up to tolerance; mercury is usually prescribed in the form of the biniodide or the bichloride from $\frac{1}{24}$ to $\frac{1}{12}$ gr. (0.0025 to 0.005), or the protiodide $\frac{1}{4}$ gr. (0.016) three times daily; salicin 10 to 15 gr. (0.65 to 1) three times daily; salicylate of soda 10 gr. (0.65) three times each day. In those individuals in whom arsenic is poorly digested, or in those with gastro-intestinal disorders, this remedy can usually be taken in the so-called Asiatic pill, which consists of acid arsenious $\frac{1}{30}$ gr. (0.002) and black pepper 1 gr. (0.06). I have found the following prescription of the greatest benefit in the disease:

℞—Acidi arsenosi . . . . . gr. j 0|06
Hydrarg. protiodidi . . . . . gr. vj 0|36
M. ft. capsulæ No. xxiv.
Sig.—One capsule after each meal or after each meal and at bedtime.

Local preparations aim primarily at the checking of the itching, and secondarily in causing the absorption of the lesions. In acute inflammatory and irritable cases mild preparations are indicated. Resorcin 5 to 8 gr. (0.32 to 0.5), phenol 5 to 10 drops (0.3 to 0.6), thymol $\frac{1}{4}$ to $\frac{1}{2}$ gr. (0.016 to 0.03); powdered zinc oxide, powdered bismuth subcarbonate, subnitrate, or subgallate, powdered talcum, $\frac{1}{2}$ dr. (2.), glycerin 10 to 15 minims (0.6 to 1.) to the fl. oz. of water (30.) camphor water or lime water are all of use. In those less acute more stimulating remedies may be employed, such as liquor carbonis detergens, or oil of cade. Liquor carbonis detergens has proved the most satisfactory local application, in all stages of the disease that I have employed it; in the acute eruptions starting in the strength of 10 minims (0.6) to the fl. oz. (30.) of camphor water and gradually increasing until in the most chronic cases the undiluted preparation is used. In those cases exhibiting large lesions of a hypertrophic and verrucous type on the lower legs very stimulating preparations are required, such as oil of cade, 1 to 2 dr. (4. to 8.) to the ounce (30.), made up in a paste; powdered zinc oxide and powdered starch, each 2 dr. (8.), petrolatum $\frac{1}{2}$ oz. (15.); salicylic acid, 20 to 30 gr. (1.3 to 2.) to the ounce (30.) of petrolatum or paste; ammoniated mercury 30 to 40 gr. (2. to 2.6) to the ounce (30.); and in certain instances the cure can only be effected by exposure to the roentgen rays.

LICHEN PLANUS MORPHEICUS.

Synonym.—Lichen planus sclerosus et atrophicus. (Crocker and Stowers.)

This is a rare form of lichen planus which was first described by Hallopeau in 1889, and the first case of which was under the observation of Morrant Baker in 1882.

The lesions are usually grouped, symmetrical in distribution, and located on the lower portion of the forearms, occasionally upon the elbows, the knees, the wrists, and the backs of the hands and feet. The eruption consists of papules flat and angular, at times oval, round or convex, solid, of a whitish color and a central horny plug. Excepting for the color and the horny plug, they resemble markedly the papules of lichen planus. A narrow reddish or pigmented areola surrounds some of the lesions. After the casting off of the horny plug a central depression and distinct atrophy are observed. The papules when they run together resemble somewhat morphea, but the horny plugs and distinct papules differentiate that condition. According to Hallopeau, a black projecting horny point forms with a bright red areola; the black plug eventually falls out and the plaque loses its color. Moderate itching is present. Montgomery and Ormsby have, by a careful study, differentiated the so-called "white spot disease" (*morphea guttata*). Dubreuilh considers that lichen morpheicus, circumscribed guttate scleroderma, circumscribed cutaneous atrophy, atypical lupus erythematosus, etc., may be examples of this affection. The buccal mucous membrane may show typical lichen planus lesions.

Histologically the condition resembles lichen planus, excepting that the areas of cellular infiltration are more deeply situated and for the production of fibrous tissue in the papillary layer.

Treatment is the same as recommended in chronic and hypertrophic lichen planus.

LICHEN NITIDUS.

This rare affection was first described by Pinkus, and has since been reported, notably, by Lewandowsky, Arndt, Kyrle and McDonagh, and Sutton. The lesions consist of small, flat, sharply marginated, circular or polygonally-shaped, slightly elevated papules of a whitish, pale red or yellowish-brown color. The lesions are usually discrete, rarely grouped, run a persistent course, sometimes disappearing spontaneously, are of a uniform size, and occasionally a minute depression is observed upon the summit. The genital regions are prone to the outbreak, also the abdomen, in the vicinity of the umbilicus, the flexures of the elbows, and the

palms. There are no subjective symptoms. The male sex is usually attacked. The etiology and pathology are unknown, although Kyrle and McDonagh consider that it is probably caused by a tuberculous toxin. Histologically the lesion has a structure closely resembling a tubercle.

The lesions resemble somewhat lichen planus, small multiple flat warts, the flat form of lichen scrofulosorum, and lichenoid syphiloderm. The course of the affection is apparently little influenced by treatment.

PITYRIASIS RUBRA PILARIS.

Synonyms.—Lichen psoriasis (Hutchinson); Lichen ruber (Hebra); Pityriasis pilaris (Devergie, Richaud); Lichen ruber acuminatus (Kaposi).

Definition.—Pityriasis rubra pilaris is a rare, mildly inflammatory exfoliative disease, characterized by follicular, conical or rounded grayish, pale red, or reddish-brown papules, with a horny center, tending to become generalized in distribution.

According to Crocker, the first described instance of this affection was communicated by an Englishman, Claudius Tarral, to his former preceptor, Rayer, in 1828. From the synonyms mentioned above can easily be seen the number of appellations that have been assigned to the affection. The Dermatological Congresses of 1888 and 1892 practically decided that the disease described by Kaposi as *lichen ruber acuminatus* was in its essential features, at least, the same affection previously termed by Devergie *pityriasis rubra pilaire*. The other titles that have been employed apparently describe analogous conditions.

Symptoms.—The disease may be of a limited or generalized distribution. The first manifestation consists, in most instances, of a scaly condition of the scalp and thickening of the palms and soles. The characteristic lesions are follicular, pale red or brownish, acuminated, hard papules, with a horny center, at times, pierced by a hair. The areas first attacked by papules, usually at least, are the dorsal surface of the fingers and hands, about the abdomen, the extensor aspect of the extremities, especially the forearms, and the neck. Patches are formed by aggregations of papules rather than by peripheral extension of the individual lesions. The confluent areas are of a yellowish-red or grayish-red color, thickened, rough, dry, and somewhat scaly.

The skin of the face may be dry, somewhat thickened, and scaly; ectropion of the lower eyelids occasionally is observed. The nails in certain instances are brittle, rough, dull, striated and tend to

break and crack. The disease, at times, extends generally over the cutaneous surface and a thickened, harsh, dry and somewhat scaly condition results. The papular element is frequently unrecognizable in this latter type, excepting for the discrete papules on the dorsum of the fingers. In less marked instances large linear and irregularly shaped plaques are observed. Slight itching may be present. The health is usually unaffected.

Etiology.—The disease is of rare occurrence and the etiology is unknown. In the majority of instances it begins in childhood or in young adults. Heredity, sex, and race do not determine an outbreak.

Fig. 18.—Pityriasis rubra pilaris.

Pathology.—Hartzell's examination of sections from a case of pityriasis rubra pilaris showed considerable pathological changes. The epidermis was thickened, particularly in the horny and prickle-cell layers. The greatest thickening of the horny layer was observed in and around the mouth of the hair follicle, in which it formed large plugs, which projected above the surface. The nuclei of the rete cells exhibited enlargement, and poor or absence of staining qualities. The papillæ of the corium were considerably lengthened, slightly widened, and contained round cells and a few "Mastzellen." There was an abundant round-celled infiltration along the entire length of the hair follicles.

Diagnosis.—The diagnosis usually offers very little difficulty if the salient features, such as a follicular papule, pierced by a hair, with a horny surface, more or less generalized, the thickened, harsh and scaly skin, the thickened palms and soles, and the scaliness of the face and scalp are considered. Dermatitis exfoliativa does not present the follicular papules, the infiltration of the skin,

PLATE III

Pityriasis Rubra Pilaris.

(Courtesy of Dr. C. N. Davis.)

and has a marked exfoliation and redness. The palms of the hands and the soles are rarely attacked in psoriasis, the face only exceptionally. Follicular papules are absent, and the patches are bright red and covered with a thick, silvery-white scale, and the lesions extend peripherally. The papules in lichen planus are flat, of a violet color, shiny in appearance, and lack the follicular character of pityriasis rubra pilaris. The distribution is also different. Ichthyosis dates from infancy and lacks the inflammatory aspect of the present affection.

Prognosis.—The course of the disease is slow, in most instances ending in recovery, but relapses may occur years after the initial attack. There have been very few fatalities reported, excepting in the series originally reported by Hebra, in which there were 13 deaths.

Treatment.—The general tone of the system should be raised by the administration of tonics, nourishing food, and a study of the hygiene. Arsenic has not proved of particular value, excepting in the hands of Hebra, but it should be tried in extensive cases. Crocker recommends the subcutaneous injection of pilocarpin nitrate in $\frac{1}{6}$ gr. (0.01) doses, and active exercise combined with alkaline baths, and friction with soft soap, to restore the sweat secretion. He also suggests thyroid extract of an intitial strength of 5 gr. (0.32) daily, increased to 15 gr. (1.), each day, in addition to local treatment.

External applications are practically the same as are suggested in the treatment of psoriasis. Bran, starch, or alkaline baths may prove efficacious in irritable cases. The skin may be softened and lubricated by oils or ointments, such as olive oil, petrolatum, equal parts of lanolin and petrolatum, salicylic acid 10 to 30 gr. (0.65 to 2.) to the ounce (30.) of benzoinated lard. Weak tar preparations may be employed. Various authorities have employed strong resorcin and pyrogallol ointments; the latter's application should be limited to small areas. Tincture of green soap may be used in cleansing the scalp and followed by an ointment consisting of 20 gr. of salicylic acid (1.3) and 30 gr. (2.) of ammoniated mercury to the ounce (30.) of petrolatum. The roentgen ray may be used on small, thickened areas.

PSORIASIS.

Definition.—Psoriasis is a chronic inflammatory disease, characterized by the development of variously sized, rounded, sharply marginated, reddish, thickened patches, covered with thick, imbricated, silvery-white scales, attacking chiefly the extensor surfaces and the scalp.

Psoriasis is always a dry, scaly, papular disease. Vesicles and pustules and oozing do not occur.

Symptoms.—The affection starts with the appearance of a few pinhead-sized, slightly elevated, sharply marginated, infiltrated red flat papules with thin whitish scales. These papules increase in number, size, thickness, and the abundance of the scale. The scale usually does not come quite to the circumference of the lesion and is of an imbricated or "piled-up" character.

FIG. 19.—Psoriasis. (Courtesy of Dr. M. B. Hartzell.)

Although the affection may be of generalized distribution, in the majority of cases the disease is prone to attack the extensor surfaces of the extremities, particularly the elbows, the knees, and the scalp. The face is only exceptionally attacked, excepting that the patches may be observed along the hairy line of the forehead, extending downward from the scalp. The palms and the

soles are rarely involved, and the dorsal surface of the hands and feet only exceptionally, and in extensive cases.

The course of the disease is slow and recurrences are common. There seems to be a tendency for the affection to be more marked in winter and for relapses to occur during the cold weather. In mild cases there may be an almost complete disappearance of the eruption in warm weather. Relapses may occur months or years after the previous outbreak.

FIG. 20.—Psoriasis. Typical distribution on the extensor surfaces.

There are numerous patches present or only a few, and the lesions may be of a fairly small, medium, or large size. Various descriptive terms have been applied to the different-sized lesions; if of a pin-head size, *psoriasis punctata;* drop size, *psoriasis guttata;* discoid lesions, coin size, *psoriasis nummularis;* in patches in which involution is taking place and there is central clearing, *psoriasis*

circinata or *annulata;* coalescence of these ring-shaped areas gives rise to lesions of a serpiginous outline and gyrated appearance, *psoriasis gyrata;* by the confluence of scaly plaques large, thickened, scaly areas are formed, *psoriasis diffusa;* when the latter patches are densely infiltrated and covered with an unusually thick scale they are designated *psoriasis inveterata.* When the cutaneous

Fig. 21.—Psoriasis. Typical location. Some of the patches have undergone central clearing.

surface is almost covered with one sheet of eruption the term *psoriasis universalis* is applied. Exceptionally there is a tendency to a central heaping up of the scales, to which has been applied the title *psoriasis rupioides* or *psoriasis ostreacea.* Rarely a papillary hypertrophy or wart-like surface may be observed upon some of the plaques, particularly on the extremities, and the term *psoriasis verrucosa* is used.

The lesions in the first attack of the disease, particularly in childhood, are usually small, from a pin-head to a three-cent-piece in size, and although they are typical in every way of the affection; the infiltration and the thickness of the scale formation and the lesions are of a smaller type than in relapsing attacks, or if the disease has run a long course. New lesions continue to appear over a long period. Large patches always arise from the peri-

Fig. 22.—Psoriasis. Disease is undergoing involution.

pheral growth of a small, beginning lesion; the difference in rapidity of growth of the various papules governs the multiformity in size. If the red papule after the removal of the scale is gently scraped with the finger-nail, minute abrasions of the vascular papillary layer of the corium results and minute drops of blood are observed.

Involution of the disease may occur both by a gradual uniform disappearance of the entire patch, or disappearance of the central portion is first noticed.

The affection in the beginning may remain limited to certain areas for some months or longer and then spread more or less generally over the body; the precursory patches are more apt to be observed on the scalp or upon the extremities. The disease, however, instead of running a chronic course of development, may appear acutely, reaching its height, hundreds of areas being present, in the course of a few days or weeks. The lesions under these circumstances are usually more inflammatory and the scale is thinner. Those developing acutely are apt to progress into the usual chronic type of the affection.

The scalp may be attacked by scattered areas or show a general involvement. The lesions are apt to form under and about the nails, and as a result they become brittle or granular, opaque, and sometimes thickened; exceptionally being temporarily lost.

Psoriasis lesions are very apt to develop on areas of irritation or slight injury, for instance on scratch marks, on tattoo marks, and about scars.

Subjective symptoms are usually slight or absent; if itching is present it is very slight. Sequelæ of the disease are usually absent. Occasionally there is transitory pigmentation. A few instances, however, have been reported in which superficial scars, keloids, persistent deep pigmentation, or permanent loss of pigment have resulted. Rarely epithelioma has developed upon patches of psoriasis. The disease in a few cases, after years of chronicity, has run into an outbreak resembling dermatitis exfoliativa.

Etiology.—The etiology of psoriasis is unknown. The disease comprises from 2 to 7 per cent of skin cases, varying somewhat in different countries. Males show a slightly greater predisposition to the affection than do females. Most cases are observed between the ages of fifteen and thirty years, sometimes younger and also at a later period. Although various observers have recorded cases in those in poor physical health, the great preponderance of cases that I have seen developed in those unusually healthy. There is a great tendency for cases to develop during the winter months, improvement and even disappearance of the eruption frequently occurs during the summer; the converse, however, may be true. Various constitutional disorders have been mentioned as causal: rheumatic and a gouty tendency; defective kidney elimination; pancreatic disease; digestive and nutritive disorders; severe systemic disease. The eruption is frequently worse or recurs during pregnancy or the nursing period. The lowered tone of the general system, according to some, produced by the excessive use of tobacco, tea, and coffee, strumous conditions, and syphilis, are predisposing to an outbreak. In certain instances an attack of the affection has been attributed to the ingestion of sodium borate. According

to Erasmus Wilson, heredity plays a part in about 30 per cent of cases. Various neurotic conditions, such as fright and shock, have been attested as causative. Acute toxemias have been brought forward as causal. Schamberg has suggested that abnormal retention of nitrogen is either causative of the affection or makes the outbreak more severe.

The parasitic origin of the affection has been frequently mentioned, chiefly based upon the fact that the disease has occurred at the site of and following various injuries, and by the fact that the circumference of one patch melts away when in contact with that of another. The question of insufficient light, "light hunger" has been entertained, as the disease tends to attack the covered portions of the body and the lesions are improved by exposure to the actinic rays of the sun.

Pathology.—Although numerous organisms have been found in cases of this affection, no one can be stated as in any way causal, and experimentation has been negative in the reproduction of the affection. Many cases suggest a trophoneurotic or vasomotor origin, while others are suggestive of toxic or systemic conditions.

There is a subacute or chronic inflammation of the papillary or subpapillary portions of the corium, with vascular dilatation, moderate edema, and infiltration of polymorphonuclear and small round cells, chiefly in the neighborhood of the vessels, sweat glands, and hair follicles. The papillæ are elongated by the pressure from the interpapillary prolongations of the rete. The latter show a marked hyperplasia of these prolongations, the number of cells being less over the papillæ. There is some intercellular edema; the transitory layers of the epidermis are absent, and the outer cells retain their nuclei, and there is an accumulation of cells between the lamellæ. The silvery white appearance of the scale is apparently caused by air between the cells.

Diagnosis.—Psoriasis has to be distinguished particularly from eczema, seborrheic dermatitis, papulo-squamous syphiloderm, and pityriasis rosea.

Eczema has not the sharply marginated character, the silvery-white scale, the tendency to attack the extensor surfaces, to extend along the hairy margin, and patches are not of the same formation; but there is rather a yellowish-brown scale, the patches have a less sharp margin, it tends to attack the palms and the soles and also the face, and there is usually intense itching, and not infrequently areas of oozing are associated with even the squamous type.

Seborrheic dermatitis attacks the scalp, the eyebrows, the eyelids, the alæ of the nose, the mustache region, the sternum, the interscapular region, the arm-pits, the pubic region, the bends of the

elbows, and the popliteal spaces. The patches, therefore, have a very different distribution from psoriasis, and are less sharply marginated, not so infiltrated, and covered with a greasy-yellow instead of a silvery-white scale.

The *papulo-squamous type of syphilis* is generalized in distribution, including the palms, the soles, and the face. The lesions are of a multiform type, not so deeply infiltrated as in psoriasis, of a dark red to a ham color, with thinner scale, brownish in color; there are lesions of the mucous membranes, glandular enlargement, and the various other concomitants of the disease.

The patches of *pityriasis rosea* are limited to the trunk, the upper portions of the extremities, and consist of pinkish plaques and annular lesions, with slightly scaly fawn-colored centers; they are superficial in type, and run a more or less self-limited course.

As the papules of *lichen planus* are violaceous in color, and have an angular base and shiny appearance, and as the scale in the confluent lesions is thin rather than thick, and as the scalp is not attacked and the mucous membranes frequently, the two conditions should never be difficult to distinguish.

Ringworm could hardly be taken for psoriasis excepting in those instances in which very few lesions of the latter are present. The annular patches alone resemble tinea, and as this form of lesion is usually in the minority, the typical thick, imbricated patches usually being in preponderance, offer a very clear differentiation. There are very rarely more than a few ringworm patches present; the border is elevated, and is often made up of vesico-papules; the history and course of the disease is entirely different, and the presence of fungus, by a microscopical examination, proves the diagnosis. *Seborrhea* is limited to the scalp and consists of yellowish-white scales with no reddened surface. *Favus* is differentiated by its sulphur-yellow cups, hair loss, and scarring.

Prognosis.—Psoriasis in a great majority of instances runs a chronic course and tends to recur. Exceptionally the disease runs into a dermatitis exfoliativa. Relapses develop months and at times years after the previous attack, or a few lesions may be more or less continuously present. No promise can be made as to length of freedom from recurrence. Improvement or disappearance of the outbreak can be effected in every instance.

Treatment.—The treatment of psoriasis consists of internal and external remedies. Each case of the affection should be studied most carefully to determine any possible cause of the affection or any derangement of the system that might continue the condition or make the outbreak more severe. Although in most instances, or at least a great many cases, no constitutional or

intercurrent diseases are present, in some, at least, symptomatic medication has to be instituted.

The diet should be simple and nutritious, and notwithstanding Bulkley's contention that a meat diet is detrimental, the partaking or elimination of this food has made no appreciable difference in the cases I have treated. Alcohol, coffee, and tea should be used sparingly. The influence of climate in some inveterate cases is most important. In milder climates where the temperature is never cold, and particularly in warm climes, there is a tendency to betterment or disappearance of an outbreak. Seashore benefits some while high altitudes help others.

Several remedies have a marked effect both on the lesions present and those that are appearing; the chief of these is one of the preparations of arsenic. Fowler's solution is the arsenical compound most frequently employed, in the dose of $\frac{1}{2}$ to 1 minim (0.03 to 0.06) for a child seven or eight years, and 5 minims (0.3) for an adult, three times daily, immediately after each meal, and well diluted with water; this preparation is at times increased, 1 minim daily (0.06) until a maximum of 10 minims (0.6) after each meal is administered. The vehicle employed is usually peppermint water, the compound tincture of cardamom, or the compound tincture of gentian. A solution of sodium arsenite may be substituted, and in certain instances is more easily digested. Arsenic trioxide may be given in doses of from $\frac{1}{40}$ to $\frac{1}{20}$ (0.0016 to 0.0032) gr. in either pill or tablet, and may be more easily taken by the stomach if 1 gr. (0.06) of black pepper is added to each. Sodium cacodylate has been prescribed and the results have been satisfactory; the dose is from $\frac{1}{2}$ to 3 gr. (0.03 to 0.24) three times daily. The one great objection to the latter preparation is the odor of garlic imparted to the breath. Atoxyl and also arsphenamine have been given hypodermically, but with no greater benefit than other forms of arsenic. Next in importance to arsenic in the treatment of psoriasis stands salicin and sodium salicylate, particularly in those cases in which numerous new lesions are appearing and of a particularly inflammatory type. Arsenic is contraindicated in the latter class of cases. Salicin is administered in capsule form, 10 to 15 gr. (0.65 to 1.), 2 capsules, 5 to $7\frac{1}{2}$ gr. (0.32 to 0.5) in each, so they will not prove too bulky, after each meal and at bedtime. Sodium salicylate is prescribed in 10-gr. (0.65) doses, best administered in a liquid vehicle because it is more thoroughly and rapidly absorbed, following each meal and before retiring. Haslund recommends potassium iodide in ascending doses, administering as much as 600 gr. (38.6) in a day; it is wise, however, unless the indication is unusually marked, to limit the dose to 10 gr. (0.65), three times daily. Carbolic acid, 1 or 2 minims (0.06 to 0.12), well diluted, three times daily, has been given.

Numerous other preparations have been administered by certain dermatologists, such as wine of antimony in 5- to 10-minim doses (0.3 to 0.6); chrysarobin, $\frac{1}{6}$ gr. (0.01) rubbed up with sugar of milk, three times daily; in plethoric and rheumatic subjects liquor potassæ, potassium citrate or acetate, or sodium bicarbonate in doses of from 10 to 30 gr. (0.65 to 2.), well diluted with water. Phosphorus; tar; copaiba; oil of turpentine; cantharides; colchicum; thyroid extract; and pilocarpin have also been given.

External treatment is paramount in the eradication of the lesions already present, and frequently has to be persisted in over a considerable period of time. The scales should in the first place be removed so far as it is feasible. This may be accomplished by thorough maceration in olive oil, or vaseline, and thorough and frequent warm baths. Salicylic acid, 10 to 20 gr. (0.65 to 1.3) to the $\frac{1}{2}$ oz. (15.) each of lanolin and petrolatum, also has a marked softening effect upon the epidermic scales. Prolonged baths, as recommended by Hebra, lasting from four to eight hours daily, or medicated and of shorter duration, may be given. Tar, sulphur and other substances may be used in these soakings. C. N. Davis suggests two baths daily, each containing three double handfuls of sodium hyposulphite; the same medicated solution may be used by the patient for half an hour before retiring and on rising. In generalized eruptions, Hyde recommended the wearing of undershirts and drawers made of soft rubber cloth in order to produce profuse sweating, as by the maceration which results there is a tendency to the disappearance of the lesions in some of the cases.

The remedies employed in those instances, which are not ameliorated by the above means, have to be selected according to whether the outbreak is generalized or localized, thick or thin, small lesions or large patches, and of a hairy or non-hairy part. The preparations which I have found most successful are chrysarobin, the various tar compounds such as oil of cade, oil of birch, picis liquida, liquor carbonis detergens; resorcin, salicylic acid, and ammoniated mercury. In cases of more or less generalized distribution the tar compounds are usually the most efficacious. The best of these are the oil of cade (oil of juniper) or the oil of birch (oleum Rusci), employed in the strength of 1 fl. dr. (4.) to the ounce (30.) of olive oil or petrolatum, and increased to the full strength if the patient's skin is not irritated or if the lesions are not improved by the lesser strength. The preparation is thoroughly rubbed into the lesions twice daily. The great drawback to the oil is its pungent, disagreeable odor, sticky nature, and the fact that it stains the clothing. Ung. picis liq. is employed, a dram (4.) to the ounce (30.) of petrolatum or zinc oxide ointment, and also increased in strength until the official ointment is used

undiluted. Liquor carbonis detergens, consisting of 1 part of coal-tar and 8 parts of tincture of soap bark, may be prescribed in either a watery preparation, an alcoholic solution or an ointment base; 1 fl. dr. (4.) to the ounce (30.) is first used and increased unless the skin is irritated by stronger preparations. This is the least disagreeable of the four tar compounds. The odor in the mild strength is not unpleasant and the staining of the garments is not so pronounced as from the others. The following combination is useful in the generalized cases of psoriasis: Liquor carbonis detergens, 4 fl. dr. (16.); powdered zinc oxide, 2 dr. (8.); glycerin, 1½ fl. dr. (6.); camphor water, 4 fl. oz. (120.). The camphor water hides somewhat the tar odor, the glycerin prolongs the effect of the preparation and prevents too great dryness of the skin surface, and the zinc pales somewhat the color of the preparation.

In cases in which there are a few large and extremely thick areas, chrysarobin is to be recommended. As chrysarobin stains the skin a reddish color, which later becomes reddish-brown and finally brown, it has to be applied carefully only to the areas to be treated and usually not in the vicinity of the face, because it may induce a severe conjunctivitis. The patient should also be warned to cleanse the hands thoroughly after applying the preparation, so that, accidentally, none of the remedy is rubbed into the eyes. In order to limit the action of the drug strictly to the area treated and to avoid irritation of the surrounding healthy skin, the preparation is applied in a paste. Chrysarobin is employed in the strength, usually, of from 8 to 10 gr. (0.5 to 0.65) to the ounce, increasing exceptionally to 20 or 30 gr. (1.3 to 2.); its action may be increased by the addition of salicylic acid 10 gr. (0.65) to the ounce (30.). The following prescription is of use: Chrysarobin 10 gr. (0.65); salicylic acid, 10 gr. (0.65); powdered starch and powdered zinc oxide, each 2 dr. (8.); petrolatum, 4 dr. (15.). Chrysarobin may also be employed in collodion or flexible collodion ½ dr. (2.) to the ounce (30.). The use of resorcin or ammoniated mercury is limited to small surfaces.

The eradication of psoriasis from the scalp is frequently a difficult matter, as in a great many instances the condition recurs almost immediately after its elimination. The tar compounds have to be used carefully in those with blond hair for fear of staining and discoloration. Liquor carbonis detergens is one of the best preparations to be employed in increasing strengths. The prescription frequently found advantageous consists of liquor carbonis detergens, 6 fl. dr. (24.); acid salicylic, 50 gr. (3.3); castor oil ½ dr. (2.); and, alcohol, 3 fl. oz. (90.). Oil of cade 1 (4.) or more drams to the ounce (30.) of olive oil, or equal parts of lanolin and petrolatum. Both resorcin and ammoniated mercury are applied efficiently in

scalp cases, the latter in the strength of from 40 to 60 gr. (2.6 to 4.) to the ounce (30.) of petrolatum, lanolin, cold cream, benzoinated lard, or goose grease. In intractable cases the following combination, if it causes no irritation, may be prescribed: Resorcin, 10 gr.; salicylic acid and ammoniated mercury, each 1 dr. (4.); lanolin 2 dr. (8.); petrolatum, 3 dr. (12.). In those cases in which all other preparations have failed, particularly in the male sex, chrysarobin, salicylic acid, each 20 gr. (1.3), lanolin, 1 oz. (30.) may be ordered, warning the patient to rub in only a small quantity, using it only on dark-haired individuals, and allowing none to come in contact with the skin of the face.

In the treatment of the nails and beneath these, ammoniated mercury, ½ dr. (2.) to the ounce, salicylic acid or resorcin, ½ dr. (2.) or liquor carbonis detergens, ½ to 1 dr. (2. to 4) to the ounce (30.), may be employed, made up in one of the thin ointment bases.

Various other preparations have been applied in psoriasis—pyrogallol in an ointment 20 to 60 gr. (1.3 to 4.) to the ounce (30.), applied to small areas; betanaphtol, 20 to 60 gr. (1.3 to 4.); thymol, 20 to 30 gr. (1.3 to 2.) to the ounce (30.); a solution of potassium permanganate 1 to 3000, 1 to 2000, in 70 to 90 per cent alcohol, containing 2 per cent of salicylic acid. The roentgen-ray is frequently efficacious in the treatment of large thick patches, one area alone being exposed at each seance.

THE CHRONIC RESISTANT MACULAR AND MACULO-PAPULAR SCALY ERYTHRODERMIAS.

Stelwagon employs this general heading to describe various rare affections which more or less resemble one another, partaking somewhat of the clinical types of seborrheic dermatitis, the superficial type of psoriasis, pityriasis rosea, the early prodromal erythemato-squamous eruption of granuloma fungoides, and the involution stage of lichen planus.

It is an undecided question whether these affections are different manifestations of the same disease or closely allied conditions. These dermatosis present certain clinical features in common: the slow evolution and superficial character of the eruption, sharp margination, usually 2 to 6 cm. in diameter, pinkish or faint red color; the mild degree or entire absence of infiltration of the skin and of itching; and their persistence in spite of treatment. They have been termed by Unna, parakeratosis variegata; by Crocker, lichen variegatus; by Boeck, dermatitis variegata; by Brocq, erythrodermia pityriasique en plaques disseminees and parapsoriasis; by Jadassohn, psoriasiform and lichenoid exanthem, and dermatoses psoriasiformes; by Juliusberg, pityriasis lichenoides

chronica; and by Colcott Fox and Macleod resistant maculo-papular scaly erythrodermias.

Parakeratosis Variegata (**Parapsoriasis Lichenoide**) was the first dermatosis of this group recognized and was described by Unna and Santi and Pollitzer in 1890. The outbreak usually occurs between ages of thirty and forty years and in robust individuals. The eruption is distributed over the trunk and the extremities, and has a retiform, net-like character; the network consisting of red streaks and patches, varying in shades in different locations. The outbreak is sharply marginated, very superficial, and covered with fine, lamellated scales. The healthy skin in the meshes of the net may show irregular sunken areas. Certain cases may show a plaque arrangement.

Dermatitis Psoriasiformes Nodularis (**Pityriasis Lichenoides Chronica**) was first described by Jadassohn in 1894. The eruption is very superficial and consists of pin-head- to pea-sized, well-defined, round or oval, intensely red papules; the smaller lesions are slightly acuminate, while the larger are of a paler shade, more apt to be flat, with occasionally a central depression. The lesions are somewhat firm, some are follicular, and are covered with very fine scales, which are thicker in the center, and may, at times, only be discerned by scratching the surface. The scratched lesion is red and bleeds but little; there are no bleeding points as in psoriasis. The eruption gradually increases by the appearance of new papules. An areola of redness may be observed in the beginning. Microscopically the lesions, in some of the reported cases have had the aspect of a tuberculide.

Parapsoriasis is the term introduced by Brocq to cover cases of this disease and he divided the affection into three groups: **Parapsoriasis guttata** (*resembling markedly psoriasis*); **parapsoriasis lichenoides** (*resembling both lichen and psoriasis*); **parapsoriasis in patches** (*resembling superficial psoriasis, seborrheic dermatitis, and erythrodermia pityriasique en plaques disseminees*).

ECZEMA.

Definition.—Eczema is an acute, subacute, or chronic inflammation of the skin characterized by the development of erythema, papules, vesicles or pustules, slight or marked infiltration of the integument, a secondary crust or scale formation, and accompanied by itching and burning.

The writer concurs thoroughly in the view expressed by Ormsby[1] in regard to the relationship between eczema and dermatitis: "A

[1] Ormsby: Diseases of the Skin, 2d ed., 1921.

vexed and unsettled question among dermatologists is the relation of eczema to other forms of dermatitis. In its historical evolution many separate and distinct diseases have been grouped under this title. The present tendency is to exclude, as rapidly as possible, all forms of dermatitis which have a definite cause, and which upon removal of this cause, disappear. Eczema is a dermatitis and it is not possible to say in every case which title is the more appropriate. A convenient division classes under dermatitis those forms of involvement of the skin which result from recognized external causes and which subside upon removal of the cause."

Symptoms.—Eczema may have its beginning on any portion of the integument; it may remain limited to the part first attached; several parts may be attacked synchronously; it may have a more or less generalized distribution in the beginning, or may extend universally either slowly or rapidly. The outbreak is usually more or less localized. The eruption may consist of erythema, papules, vesicles or pustules, and later scales and crusts may be observed. Usually more than one type of outbreak is present. In other words the eruption is frequently multiform, mixed, and very often one type predominates. The character of the outbreak also is apt to change as the disease progresses. For instance, an erythematous outbreak may by local irritation become vesicular; vesicles may likewise be added to a papular type; vesicles may also become pustular and the oozing form crusts; scale formation is frequently added to the dry forms of the disease. In every type of the disease itching is a marked symptom and very often burning or the sensation of heat is also present. There is apt to be redness, possibly slight or marked swelling, frequently moisture, and the patches usually fade off into the sound skin. Certain descriptive terms have been applied to the mixed types of the disease, such as *erythemato-papular, erythemato-squamous, papulo-squamous, vesiculo-papular, vesiculo-pustular,* etc.

The disease has been entitled acute, subacute, chronic, but these terms can scarcely be applied accurately, because an outbreak may be of long duration and yet of a very acute type, or lasting but a short period and less acutely inflammatory.

Certain areas are more prone to an outbreak at different ages; the face or scalp or both are more apt to be attacked in infants and young children; adults in active employment exhibit the outbreak usually upon the fingers, the hands and the forearms, and not infrequently on the scrotum and anal regions in the male, and the vulva in the female; in older life, the face and the lower legs may exhibit the eruption. Adults show the tendency also more or less markedly to an attack on the flexure surface of the elbows, the knees, and the axillæ. The nails also may be attacked early but

usually late in the disease, and are observed to be dry and often crumbling, or may be dry and show a tendency to crack.

Constitutional symptoms are absent excepting in the generalized type of the affection.

Certain complications may be observed, as, rarely, bleb formation, furuncles, impetigenous and ecthymatous lesions, which are caused by a secondary pus infection. Lymphatic glands in the neighbor-

FIG. 23.—Eczema of the papulo-vesicular variety.

hood of the outbreak, particularly in the vesicular and pustular types of outbreak, especially in infants and young children, may be enlarged. In eczema rubrum of the leg, in adults usually of somewhat advanced age, is frequently seen associated with varicose veins (*eczema varicosum*), and a tendency is present to the formation of leg ulcer (*ulcus varicosum*). Several terms have been applied to the moist form of eczema, such as *eczema humidum*, moist eczema, moist tetter, salt rheum, weeping eczema. In those cases that

exhibit a dry and scaly surface, the diagnosis of *eczema siccum*, dry eczema, dry tetter may be made.

Eczema Erythematosum.—This type of eczema is most frequently observed upon the face and most often in middle-aged and old individuals. It may also be noted on the flexure surfaces, on the back of the neck, the hands, occasionally on other parts, and exceptionally it may be of a generalized distribution (*eczema universalis*). On the flexure surfaces the friction and the moisture may

Fig. 24.—Eczema pustulosum. (Courtesy of Dr. George H. Fox.)

give rise to abrasion of the epidermis, a mucoid discharge, and a condition is observed which resembles the inflammatory stage following an erythema intertrigo and then may be termed *eczema mucosum* or *eczema intertrigo*.

Eczema Papulosum.—Papular eczema, which was formerly titled, by some, lichen simplex, and may also be termed *eczema lichenoides* and lichen eczematodes, attacks most frequently the flexor aspects of the limbs, and at times the trunk. Its most typical form is usually found in adults, and the outbreak may

PLATE IV

Generalized Papular Eczema.

(Courtesy of Drs. Fordyce and Mackee.)

consist of only a few papules of a limited distribution, or may involve the integument extensively. The outbreak is most often sudden and consists of discrete or closely crowded reddish, pin-head-sized acuminated or rounded papules, which may form diffuse infiltrations, rounded or orbicular patches. Some of the papules may exhibit a small vesicle on the summit (called in the past lichen agria), or may develop into vesicles. The lesions are at times of follicular origin (*eczema folliculorum*, follicular eczema). This type of outbreak is of a more or less persistent character, and the itching is, if anything, more severe than in the other forms of eczema. Some of the lesions, particularly on the lower legs, develop a scale.

FIG. 25.—Eczema (pustular type). (Courtesy of Dr. M. B. Hartzell.)

ECZEMA VESICULOSUM.—The vesicular variety of the affection is the form most frequently observed. It develops upon any portion of the cutaneous surface, but is more apt to attack the face of infants and young children (so-called *crusta lacea*, or milk crust), and in adults upon the fingers, hands, neck and flexure surfaces, and in the vicinity of the joints. It is usually of a limited distribution; frequently, however, several patches are present. The

lesions are in the beginning pin-point in size and later become of the dimensions of a pin-head or larger and tend to form in closely aggregated groups. The vesicles tend to break, or are broken by traumatism, scratching, and an oozing surface with yellowish crusts results. Papules and pustules frequently are observed to be commingled with the vesicles.

Eczema Pustulosum.—Pustular eczema is also termed in certain instances *eczema impetiginosum*, and is seen most commonly on the scalp and face, especially in children and young individuals about the bearded region, on the thighs, and lower portion of the leg (*eczema sycosiforme*). Pustular eczema is not so frequently observed as the other forms of the disease. This form of outbreak

Fig. 26.—Eczema (pustular type). (Courtesy of Dr. Howard Fox.)

is not infrequently noted as secondary to a pediculosis capitis, particularly in the occipital region. The pustules tend to break, giving rise to thick yellowish, brownish, or greenish crusts (*eczema crustosum*). A marked seropurulent or purulent discharge is occasionally observed in these cases (*eczema ichorosum*).

There may be a tendency for the pustules, in adults, to be seated in or about the hair follicle (*eczema folliculorum*, *eczema sycosiforme, follicular eczema*).

Eczema Rubrum.—This is a consecutive or secondary form of eczema, and usually follows the moist types of the affection, although the erythematous variety may be the precursor. It is more apt to be found on the face and the scalp of infants and children, and

on the lower legs in older individuals. There is thickening and infiltration, at times swelling and edema; the surface is reddened,

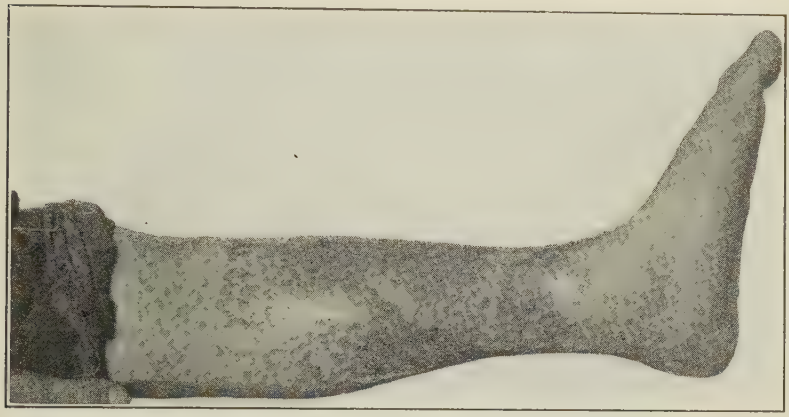


FIG. 27.—Eczema rubrum.

FIG. 28.—Eczema rubrum.

vesicular, oozing, and there is a considerable amount of crusting. In the markedly oozing type the term *eczema madidans* has been

applied. A considerable amount of heaped-up crusts may be present (*eczema crustosum*). Varicose veins and leg ulcer are frequently associated.

Eczema Squamosum.—Squamous eczema develops secondarily, most frequently after the erythematous and closely aggregated papular types, and is apt to occur in the scalp, the back of the neck, the palms, the legs, and the soles. Exceptionally the patches are sharply marginated and may be termed *eczema psoriasiforme*, or psoriatic eczema. There is a considerable amount of infiltration of the lesions and the scales are dry, thin or thick, and of a whitish to brownish-yellow color. There is a marked tendency

Fig. 29.—Eczema of the squamous type.

to the formation of fissures, particularly when the outbreak occurs in the neighborhood of the joints, on the fingers or the palms, and the terms *eczema fissum*, fissured eczema, eczema rimosum, and eczema rhagadiforme may then be applied. Chapping is an exceedingly mild form of fissured eczema. Eczema fissum is chiefly observed during cold weather and may disappear spontaneously during the summer months. There may also be a crackled type of outbreak in which the epidermis shows superficial cracks, extending only to the rete, the latter showing as pale red or reddish lines, often irregularly arranged, running parallel or at right angles; the epidermis at the edge of the cracks may be detached and slightly

turned upward (crackled eczema, furrowed eczema, eczema craquele).

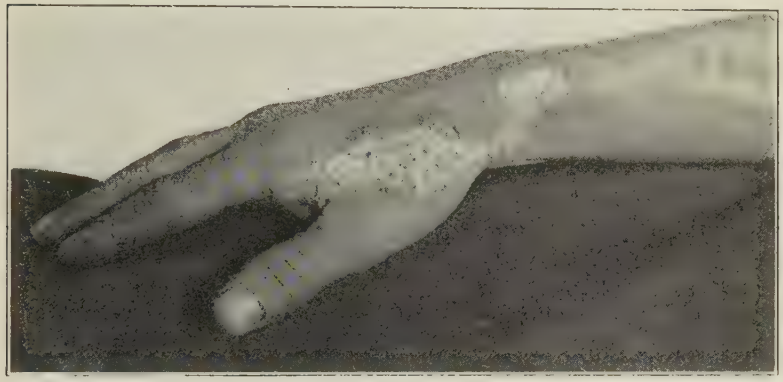


Fig. 30.—Vesicular eczema, the kind that yields so well to the roentgen-ray. Limited to the hands. (Courtesy of Drs. Fordyce and MacKee.)

In certain instances, especially on the lower legs and ankles, the soles, palms, and fingers, the skin is unusually thickened, infiltrated, exceedingly hard, elevated, sometimes sharply marginated, and of

Fig. 31.—Eczema (erythemato-squamous and fissured types).

an almost horny character, and may be termed *eczema sclerosum*. The hardening and horny characters are sometimes so pronounced upon the palms and the soles that it resembles somewhat tylosis

or callositas, and is then termed *eczema tyloticum*. Instead of the surface being of a smooth, horn-like character, the summit of the

FIG. 32.—Eczema of an erythemato-squamous type. Some crusting and oozing.

FIG. 33.—Erythemato-squamous eczema.

lesions may be rough and uneven and of a wart-like appearance (*eczema verrucosum*).

The title *parasitic eczema* (eczema parasiticum) has been applied as descriptive of cases of this affection having a sharp margination and a patchy character, not because of the presence of any fungus but owing to their resembling more or less closely ringworm. The outbreaks which have been so classed, usually of the vesiculo-papular, squamous, or the eczema rubrum type, are most frequently found on the hands, the fingers, and the feet. Either from lack of microscopical study or incorrect technic the ringworm fungus or other fungi have not been found in these cases. Adamson, as the result of routine examination of all cases of this type, has discovered that a considerable proportion are in reality of fungous

FIG. 34.—Eczema (squamous and fissured types).

origin and therefore should more properly be classed under the heading of ringworm rather than eczema; those in which fungus is absent are placed under eczema. The so-called *eczema marginatum* might also be termed parasitic eczema, although it is of a very different type from that just described, as the ringworm fungus is invariably present; the latter is grouped under ringworm with the title of tinea cruris.

Etiology.—Eczema comprises a large number of all cases of diseases of the skin. According to the statistics of the American Dermatological Association, no less than 30 per cent of all diseases of the skin belong in this category. Eczema is not inherited, it is non-contagious, and, excepting in generalized cases and after prolonged and continuous itching, does not affect the general health. There may, however, be an inherited tendency to an irritable skin

which may therefore be more easily excited to an eczematous outbreak by lesser stimuli than the average integument. The cutaneous covering of those of the blond type is usually more sensitive than

FIG. 35.—Vesiculo-pustular eczema.

FIG. 36.—Eczema of the lips (cheilitis exfoliativa). (Courtesy of Dr. R. L. Sutton.)

those of darker coloring. A certain idiosyncrasy is the unsatisfactory explanation of causation that has to be given in a considerable proportion of cases.

Internal Causes.—Any internal condition which lowers the vitality of the individual naturally decreases the resisting power of the skin and makes the individual more susceptible to an outbreak. Gouty and rheumatic subjects are apparently prone to an outbreak. Defective kidney elimination, uric acid, lithemia, albuminuria, diabetes mellitus and diabetes insipidus have all been accompanied by attacks of eczema. Various gastro-intestinal conditions have been mentioned as causative, particularly incomplete metabolism. The term neurotic eczema has been applied to cases of this affection which are apparently more or less identified with the nervous system. In some instances, the disease is apparently of reflex origin, particularly that form associated with the dentition of infants, the so-called tooth-rash, and with intestinal parasites. Nervous shock and hysterical conditions have been mentioned as precursors of an attack. Functional and organic uterine disorders and nerve injuries have been thought to be etiologically significant. Certain outbreaks of eczema have been associated with asthmatic seizures.

External Causes.—In a paper read by the writer, in a symposium before the American Dermatological Association in 1912,[1] the external origin of eczema was discussed at length, and it was determined that fully one-quarter of eczema cases are of external origin, and almost one-sixth are caused by the trade of the individual.

The external etiology of eczema may be divided into three divisions: Parasitic origin of the disease; eczema from irritants exclusive of occupation; and so-called trade eczema.

Numerous organisms have been found in the skin of eczematous patients by such observers as Unna, Galloway and Eyre, Welch, Whitfield, Payne, Russell, Roberts, Bender, Bockhart, and Gerlach. Bockhart considers that eczema is an infective inflammation of the skin and staphylococci are the originators of the infection.

The consensus of views on the subject of the parasitology of eczema can best be drawn by the deductions made at the Fourth International Congress of Dermatology, held in Paris in 1900.

1. The majority of dermatologists do not regard eczema as a parasitic disease due to a specific organism, nor as a parasitic disease the various forms of which correspond to different organisms.

2. The morococcus, so strongly advocated by Unna as the cause of the affection, is almost universally regarded as an ordinary staphylococcus with a slight peculiarity in its growth and grouping, and not as a perfectly distinct microörganism.

3. Most observers are agreed that in the later stages of eczema,

[1] Journal of Cutaneous Diseases, January, 1913.

staphylococci and streptococci play an important part in the evolution of the lesion.

Irritants causing an eczema in either normal or susceptible skins are almost too numerous to mention. Practically every irritation, no matter how mild or strong, if it acts over a sufficient period, may cause an outbreak. Cold, heat, various climatic conditions, the local irritating effect of drugs, particularly iodoform, sulphur, mercury, carbolic acid, formalin, and formaldehyde; the application of patent or proprietary remedies, such as hair dyes, hair lotions; brass rings, fur boas, mouth washes and lip salves, anilin dyes in gloves, stockings, flannel shirts, drawers, etc., have all been causal of an attack. The various plants, ivy, oak, cow-parsnip, chrysanthemum, fresh squill root, arbor vitæ, daffodil, primrose, etc., have also caused an outbreak. Eczema has supervened upon such parasitic diseases as scabies and pediculosis. Trauma from the pressure of trusses, garters, belts, ear-rings, bracelets, and articles of dress worn too tightly, such as stays, waistbands, caps, hats, braces, and so on, have proved causative.

Occupational Eczema.—Numerous irritants which are employed both in every-day life and in various trades are causative of an outbreak. Houseworkers are prone to an attack because of the prolonged and excessive use of water, strong soaps, such as soda, sapo viridis, and naphtol, and cleaning and polishing materials. Woodworkers may exhibt an outbreak from certain kinds of wood, particularly East Indian satinwood, which contains an irritating alkaloid, chlorozylonin, and from teakwood, because of an essential oil; the cocuswood also contains an irritating resin. Photographers sooner or later may be attacked because of the metol contained in the developer employed to develop plates.

Certain irritants, such as oils, greases, graphite, gasoline, benzine, lye, bluestone; muriatic, butyric, and lactic acids; shellac, turpentine, methyl alcohol; the various anilin dyes; chloride of lime, vitriol, bichromate of potash, chromic acid, aurantia, mortar, certain metals, pastes, glue, sulphite of arsenic, nicotine, sour beer, quicksilver, potassium cyanide, and others are responsible for an attack of eczema in various occupations, such as in laborers, woodworkers, printing trades, painters, millworkers, bleachers and cleaners, cloth handlers, tanners, coopers, physicians, surgeons, dentists, nurses, attendants, pharmacists and chemical workers, barbers, liquor dealers and bartenders. Those employed in the plastering, papering, and building trades; tobacco workers, furriers and hat makers, workers in metals and minerals, and mechanics in various lines frequently develop an eruption. Irritation caused by the handling of sugar, candy, chocolate, flour, various fruits, chiefly

the dried varieties, or cocoanuts and certain plants may cause an outbreak in bakers, candymakers, grocers and florists.

Pathology.—Eczema is a catarrhal disease either throughout all stages or at least in a certain portion of its course. It is a question as to whether the earliest changes take place in the epithelium, in the papillary layer, or in both. The vesicle is seated in the middle or upper layers of the rete, therefore in the epidermis, and is either formed within or between the epithelial cells. There is edema of the lower layers of the epidermis, congestion and dilatation of the papillary bloodvessels, with a throwing out of the leukocytes and serum from these channels. Proliferation of epithelial and connective-tissue cells, and a considerable infiltration of the upper portion of the corium is frequently observed in the neighborhood of the hair follicles. There may be enlargement and elongation of the papillæ. The changes may be either comparatively slight or quite marked, depending upon the chronicity of the process and the type of eruption present.

Diagnosis.—Eczema should in most instances be easily diagnosed if certain features are kept clearly in mind, such as redness, infiltration, the mixed character of the outbreak, scaling or crusting, in many instances vesicle formation and oozing, the confluence of the lesions, the tendency to fissure, and the intense itching and the frequently chronic course.

More or less generalized cases of eczema have to be distinguished from psoriasis, seborrheic dermatitis, particularly when of an erythemato-squamous type, and from scabies, pediculosis corporis, dermatitis herpetiformis, if more or less multiform in outbreak; pruritus, syphilis, pityriasis rosea, and urticaria also should be excluded; the papular type from lichen planus, prurigo, pityriasis rubra pilaris; the vesicular type chiefly from miliaria, dermatitis, dermatitis repens, and Paget's disease. Eczema of the face must be differentiated chiefly from herpes, erysipelas, acne vulgaris and acne rosacea, sycosis vulgaris, and lupus erythematosus. An attack particularly noticeable upon the scalp should be distinguished from seborrhea, seborrheic dermatitis (previously mentioned), ringworm and favus.

Psoriasis has certain areas of predilection for attack, the scalp and the extensor surfaces of the extremities, particularly the elbows and the knees. The patches are sharply marginated, infiltrated, reddish in color, are covered with a thick, silvery-white scale; bleeding-points are observed upon the removal of the scale; itching is absent or very slight; the face is only exceptionally attacked, and then at the hairy margin; the palms and the soles are rarely involved. The distribution of eczema is not particularly common

on the extensor surfaces, excepting in extensive instances. The face is frequently attacked, more or less generally rather than at the hairy margin; the palms and the soles not infrequently show an outbreak. The patches tend to fade off into the sound skin rather than to be sharply marginated; the scale is more yellowish or yellow-brown rather than silvery-white; the bleeding tendency upon the removal of the latter is absent; areas of oozing are usually found rather than the absolute dryness of psoriasis, and itching is a marked characteristic.

Seborrheic dermatitis has a different distribution from an eczema, it involves the scalp, the eyebrows, the eyelids at the border of the eyelashes, the alæ nasi, the mustache area, the sternum, the interscapular, axillary, and pubic regions, and in extensive cases the bends of the elbows and the popliteal spaces; the patches are usually of a reddish color, covered with a greasy-yellow scale, more or less infiltrated, and itching is usually mild.

In *scabies* the outbreak consists of multiform lesions, discrete rather than in patches, distributed on the flexure surface of the extremities, in the armpits, the popliteal spaces, on the hands and webs of the fingers and feet. The face is free; itching is complained of almost exclusively after the patient retires at night. There usually is obtainable the history of other cases in the same family. The diagnostic burrow can be seen in the skin, on the webs of the fingers, on the palms, the flexure surface of the wrists, on the penis in the male, and around the nipple in the female.

Pediculosis corporis attacks the extensor surface of the upper extremities, the shoulders and the buttocks; the hands, the feet, and the face are free; the itching is most severe upon removal of the clothes and also after retiring. The characteristic lesions consist of long linear scratch marks and punctate hemorrhages, the latter at the site where the animal has fed. Pediculi can usually be found in the seams of the underclothes, nightclothes, bed coverings, or upon the surface of the body.

Dermatitis herpetiformis is a rare disease and is characterized by a certain grouping of the lesions; the outbreak may consist of one type of lesion in the first attack and subsequently other forms may be observed. The vesicles do not tend to rupture as do those of eczema; confluence is usually absent. The condition runs a chronic course, alternating in improving and retrogressing. Itching is usually marked.

Dermatitis exfoliativa is almost invariably generalized, shows very little infiltration of the skin, usually is dry and with abundant desquamation; itching is usually slight, and constitutional symptoms may be present.

Pruritus is simply an intense itching of the skin with an absence of cutaneous outbreak. Because of the intense itching and the scratching excoriations may result and exceptionally pus infection.

Urticaria should be easily excluded by its acuteness, the presence of wheals, and the irritability of the skin, which may give the curious symptom of wheal formation by irritation (autographism).

Syphilis does not itch, excepting in the negro race; is of a generalized distribution; the papulo-squamous type consists of larger lesions, more discrete in arrangement, of a darker red or ham color, less scale than eczema, and is accompanied by the history of infection, the presence of the initial lesion, glandular enlargement, mucous patches of the mucous membranes, and various other concomitants of the disease.

Pityriasis rosea runs a set course of from three to six weeks, has its onset in one lesion, which is followed by an outbreak, limited in most cases to the trunk and upper portion of the extremities; the lesions are superficial, red or pinkisk, dime in size, and with a fawn-color, slightly scaly surface; itching may be absent or slight; the disease is dry, and confluence is not a marked tendency.

Ringworm consists of usually one or at most half a dozen patches, most frequently on the face, the neck, or the forearms. The circumference is usually elevated, sometimes containing papules and vesicles, the center depressed and somewhat scaly. Scrapings from the lesions, examined microscopically, show the presence of a vegetable fungus.

Miliaria (prickly heat) consists of lesions which tend to remain discrete; there is no tendency for the small vesicles to rupture, and if the latter are broken the fluid is not of a sticky character. The papular form of this affection also remains discrete. Miliaria usually is observed during the summer months or in any event after severe sweating; itching is usually slight. The disease is of sudden onset and runs a rapid course toward recovery after the removal of the cause; infiltration and inflammatory swelling are absent.

Paget's disease, although it may resemble an eczema in the beginning, sooner or later exhibits retraction of the nipple and the presence of tumor formation.

Dermatitis repens may suggest vesicular eczema, but is very sharply marginated, and the epidermis shows an undermining at the circumference of the lesion.

Lichen planus attacks the flexure surface of the wrists and lower legs, chiefly, and consists of papules with irregular bases, violaceous in color, and exceedingly shiny tops, absolutely different from that found in papular eczema.

Prurigo runs an entirely different course from an eczema; is rare in this country; outbreaks are in most cases observed on the lower

portions of the extremities and the buttocks and face; whitish, gray, and red papules, sometimes urticarial wheals, are present and the tops of the lesions are excoriated, exhibiting blood-crusts.

Pityriasis rubra pilaris is extremely rare and consists of follicular papules with a central horny plug, characteristically shown on the dorsum of the fingers, and therefore should be easily distinguished from the papules of eczema.

Herpes simplex is apt to be observed on the mucous membrane of the lips or near the buccal surface, although it may be noted on other portions of the cutaneous surface. It consists of groups of vesicles which dry up and form a crust, running a course of a week to ten days. There is no itching, but sometimes slight burning. From the self-limited course, its location and the grouping rather than confluence, it could hardly be mistaken for vesicular eczema.

Herpes zoster is unilateral in distribution, following the nerve distribution; the groups of vesicles do not tend to break, and an attack is usually preceded or accompanied by pain.

Erysipelas should be differentiated from erythematous eczema. The constitutional symptoms of chill or chilliness, fever, possibly malaise, the sharp margination of the patch, its location chiefly on the face, in the neighborhood of the nose, the glazed or shiny appearance, the hardness, the edema, vesicle or bullous formation in certain instances, offer a very clear picture from eczema.

The elimination of *acne vulgaris* and *acne rosacea* should offer very little difficulty. In the former, papules, pustules, or a combination of the two, blackheads, and at times sebaceous cysts, are present. The lesions are discrete, are found chiefly on the face, at times on the chest, the back, and the shoulders; there are no subjective symptoms; digestive disorders are frequently present. In acne rosacea the presence of blackheads, cysts, and pustules is not so constant, but there is dilatation of the cutaneous capillaries and therefore a reddish blush.

Sycosis vulgaris should be excluded by the presence of discrete pustules pierced by a hair, limited to bearded and mustache areas.

Lupus erythematosus has a butterfly arrangement on the face, the patches are pinkish to red in color, with a slight scale on the surface which dips down into the patulous gland mouth openings.

Seborrhea, or dandruff of the scalp, lacks the inflammatory character of an eczema. It consists of greasy scales, no redness, and no oozing or crusting as would be apt to be found in the latter. *Ringworm* of the scalp shows rounded areas of partial hair loss, broken-off hairs, prominence of the follicles, and a scaly surface. Microscopical examination of the loose hairs exhibits the presence of fungus.

Favus is distinguished by the yellow sulphur-color cups, the scarring and hair loss, and the microscopical presence of fungus.

Prognosis.—Eczema never produces tissue destruction and therefore scarring, and with the exception of the lower legs after long-standing cases when pigmentation may result, no trace remains after the disappearance of the disease. The health is not affected, excepting in those cases which have had a long duration, or in which the intense itching by interference with sleep may cause debility and neurasthenia. It may be stated that the affection is curable, sometimes rapidly, and in other instances after long periods of treatment. There is a tendency, however, for the condition to relapse.

Treatment.—The patient should be placed in the best possible condition, for if there is any derangement of the general system, the skin is made more vulnerable to an outbreak or the attack is made more severe and more difficult to cure. The patient should be examined carefully to determine the possibility of any constitutional fault. As the gastro-intestinal tract exerts a lesser or greater influence on these cases, the patient's dietary should be studied, and all articles such as too much tea, coffee, alcohol, excessive use of tobacco, pork, sausage, veal, the fried and greasy foods, shell-fish, fish, oysters, crabs, lobster, the highly seasoned food, wild game, cucumbers, pickles, etc., are to be excluded. Systematic exercise, plenty of fresh air, thorough mastication of the food, and sufficient sleep are all-important factors. Constipation is frequently present, possibly a loss of intestinal tone, hyper- or hypo-acidity, all of which have to be corrected. Diuretics also help by eliminating all the effete materials from the general system. Although this is frequently a minor portion of the treatment, everything helps in the cure of a frequently very troublesome and at times difficultly cured affection.

A mild laxative administered every morning or every few days is frequently of use, such as the salines, a teaspoonful to a tablespoonful of magnesium or sodium phosphate, in half a glass of water, half a tumblerful of Hunyadi water on rising, the official aloin, belladonna, strychnine, and cascara pill taken each night, or the very agreeable phenolphthalein pill, 1 to 3 gr. (0.06 to 0.18). In those with constipation associated with a slight anemic condition, the disagreeable but effective laxative tonic mixture, "mistura ferri acida," may be prescribed.

℞—Magnesii sulphatis . . . . . ℥j 30
Ferri sulphatis . . . . . gr. iv
Acidi sulphurici dilut. . . . . f℥j 4
Aquæ menthæ pip. . . . . q. s. ad f℥iv 120
M. Sig.—Tablespoonful in half glass of water, half an hour before breakfast.

℞—Sodii phosphatis . . . . . ℥j 30
Acidi phosphoric dilut. . . . . f℥v 20
Syrupi zingiberidis . . . . . f℥iss 45
Aquæ menthæ pip. . . . . q. s. ad f℥vj 180
M. Sig.—Tablespoonful in a wineglass of water three times daily.

Another efficient laxative consists of granulated sodium sulphate, 10 dr. (40.); sodium bicarbonate, 4 dr. (16); sodium chloride 2 dr. (8.); is given 1 to 2 teaspoonfuls in a tumblerful of water twenty minutes before breakfast. The following bitter tonic can be given in certain cases to advantage: Sodium salicylate, 2 dr. (8.); tincture nux vomica ½ oz. (15.); fluidextract of cascara sagrada 2 to 3 dr. (8. to 12.); compound tincture of cardamom, 3 oz. (90.); 1 teaspoonful in one-quarter glass of water twenty minutes before or directly after each meal. Bicarbonate of soda in 10-gr. (0.65) doses can be substituted for the salicylate in the latter preparation, particularly in acidity of the stomach, and at times proves even more efficacious, and tincture gentian compound can be employed for the vehicle. Occasionally, to tone up the gastro-intestinal tract, the following proves useful: Acid nitrohydrochloric, 2 to 4 minims (0.12 to 0.25); sulphate of strychnine, $\frac{1}{30}$ to $\frac{1}{40}$ (0.002 to 0.0016) of a grain; essence of pepsin and compound tincture of gentian, each a teaspoonful, well diluted in water, are given after each meal.

In the nervous class of patients, tonic or sedative treatment may be indicated—such tonics as iron, quinine, strychnine, hypophosphites, cod-liver oil, and such quieting drugs as the ammoniated tincture of valerian. In certain exceptional instances galvanic or static electricity have been employed to tone up the system.

In the so-called gouty or rheumatic cases, salicylates, salol, salophen, potassium acetate, salts of lithium, and even colchicum have been empirically employed. In those cases in which diabetes, albuminuria, malaria, etc., are present, the proper remedies should be given. Arsenic is contraindicated in all forms of eczema, particularly in those of an acute type.

Dietetics in children with eczema have to be carefully regulated, not because they have been proved in any way causal, but any derangement, particularly of the gastro-intestinal tract, may lead toward a greater severity of the outbreak. In infants the breast should be given less frequently and the feeding prolonged; in those who are slightly older, such articles as bananas, candy, cakes, pickles, and in certain nationalities beer, should be absolutely excluded; tea, coffee, and the fried and greasy foods also. The bowels should be kept well and frequently moved. For this purpose there is no better remedy than $\frac{1}{20}$ to $\frac{1}{10}$ gr. (0.003 to 0.006) of calomel, and 1 gr. (0.06) of sugar of milk, given three or four times daily, or in the regular divided dose method, one powder every half hour or every hour. Another very effective laxative, and one most children do not object to, is ½ to 1 teaspoonful of the spiced syrup of rhubarb and castor oil, taken night and morning. Van Harlingen is fond of prescribing extract of rhubarb ¼ gr. (0.016),

and calcined magnesia 2 gr. (0.12), three times daily, the dose being increased or decreased according to the age of the little patient. Cod-liver oil, in the form of the emulsion, teaspoonful doses (4.), three times daily is also efficient as a tonic. In the more or less strumous type of children the syrup of the iodide of iron, in from 10 to 30 drop (0.65 to 2.) doses, is of benefit.

External Treatment.—The external treatment of eczema is paramount although the internal treatment is frequently helpful. There are so many different types of the affection, and so many portions of the body may be attacked, that it is rather difficult to give the proper indications for the use of each remedy.

Erythematous eczema is best treated by lotions or dusting powders: the former when the applications are applied to the face and either when the outbreak is elsewhere. Lotions may either be clear or contain a sediment which dries on the skin in the form of a powder; the latter are usually preferable, excepting upon a hairy part. As the itching is a marked symptom in practically all cases of eczema, antipruritic drugs are indicated in a considerable number of the preparations required. The milder prescriptions should be first employed. A saturated solution of boric acid is frequently of benefit if the area can be kept more or less constantly moistened. A preparation which works extremely well in this type of the disease is a solution containing menthol, 1 gr. (0.06); sodium borate, 3 gr. (0.18) to the ounce (30.) of lime-water. If ½ dr. (2.) of powdered talcum, or powdered bismuth subcarbonate is added the effect will be more prolonged; phenol, 5 to 8 minims (0.3 to 0.5), may be substituted for the menthol or added to it. A dusting powder containing thymol, ¼ gr. (0.016); powdered boric acid, ½ dr. (2.); powdered talcum, 1 oz. (30.), is also efficacious; camphor, 10 gr. (0.65), and phenol, 5 gr. (0.32), may be used in the same formula.

In *vesicular eczema* with a considerable amount of oozing, a prescription containing boric acid, 15 gr. (1.); bismuth subgallate, ½ dr. (2.); glycerin, 10 minims (0.65); camphor-water, 1 oz. (30.) is suggested; or black wash (lotion nigra), full strength, or diluted with equal parts of lime-water, may be used alone or immediately followed by zinc oxide ointment; with somewhat less oozing, resorcin, 5 gr. (0.32) bismuth subcarbonate, ½ dr. (2.); witch-hazel, 1 oz. (30.), may be employed; or acid boric, 15 gr. (1.); powdered zinc oxide, ½ dr. (2.); distilled water, 1 fl. oz. (30.); or powdered calamin, 40 gr. (2.6); powdered zinc oxide, ½ dr. (2.); glycerin, 10 minims (0.65); rose-water, 1 fl. oz. (30.); or bismuth subnitrate, or bismuth salicylate, ½ dr. (2.); sodium borate, 3 gr. (0.18); water, 1 fl oz. (30.). Phenol, camphor, or thymol may be added for the itching.

Where there is some oozing, but not a very marked quantity,

pastes are of benefit. The one most frequently employed was suggested by Lassar and consists of powdered zinc oxide and powdered starch, each 2 dr. (8.), and petrolatum 4 dr. (16.); in the place of the zinc we may substitute powdered bismuth subcarbonate, bismuth subgallate, or powdered talcum. In these pastes may be placed phenol, 8 to 10 gr. (0.5 to 0.65); camphor, 10 to 20 gr. (0.65 to 1.3); menthol, 2 gr. (0.12) to the ounce (30.), for the itching; for the soothing effect, boric acid, 20 to 30 gr. (1.3 to 2); resorcin, 5 gr. (0.32), for its antipruritic properties and its sedative effect; calomel or ammoniated mercury, 10 to 20 gr. (0.65 to 1.3), for its antiseptic influence; and salicylic acid, 5 gr. (0.32) for its softening function.

The best preparation to employ in the pustular type of eczema is ammoniated mercury, in the strength of 10 to 20 gr. (0.65 to 1.3) to the ounce (30.) of Lassar's paste, or one of the ointment bases, such as equal parts of lanolin and petrolatum; calomel, 10 to 15 gr. (0.65 to 1.) to the ounce (30.) will also prove of benefit.

Papular eczema is frequently the most pruritic type of the affection and strong antipruritic substances have to be employed. A lotion consisting of thymol, 1 gr. (0.016); phenol, 8 gr. (0.5); menthol, ½ gr. (0.03); bismuth subnitrate, ½ dr. (2.); glycerin, 15 minims (1.); camphor-water, 1 oz. (30.) is at times efficient. Menthol, 2 gr. (0.12); camphor, 20 gr. (1.3); phenol, 10 gr. (0.65); powdered bismuth subcarbonate and powdered starch of each, 2 dr. (8.); petrolatum, ½ oz. (16.), may at times be employed. The most effective remedies in this connection are, however, the various tar compounds, particularly liquor carbonis detergens; the latter preparation should be used in ascending strengths, if the patient's skin is unirritated. It would be well to start with but 15 minims (1.) to the ounce (30.) of a lotion or paste base. One of the nicest combinations containing liquor carbonis detergens consists of 15 minims of this coal-tar product (1.); boric acid, 15 gr. (1.); powdered zinc oxide, ½ dr. (2.); glycerin, 15 minims (1.); camphor-water, 1 fl. oz. (30.). I usually, however, start with a fluidram (4.) of the preparation to the ounce of the mixture. This remedy may also be used in the strength of from ½ to 2 dr. (2. to 8.) to the ounce (30.) of Lassar's paste. The official tar ointment, ung. picis liquida, ½ to 1 dr. (2. to 4.) to the ounce (30.) of paste, may also be used. Oil of cade or oil of birch (oleum Rusci) may also be applied from 15 minims to 1 dr. (1. to 4.) to the ounce of olive oil (30.) petrolatum or paste.

Practically the same preparations can be employed in *eczema rubrum* as are exploited in vesicular eczema. Eczema rubrum of the lower leg is best treated with pastes rather than ointments or lotions, unless the patient can be kept off of his feet and continuous

wet dressings applied. Lotions under the latter circumstances prove efficient. The most efficient remedies consist of resorcin, 5 to 10 gr. (0.32 to 0.65); calomel, 10 to 15 gr. (0.65 to 1.); ammoniated mercury, 8 to 12 gr. (0.5 to 0.8); boric acid, 20 to 30 gr. (1.3 to 2); phenol, 5 to 15 gr. (0.32 to 1); camphor, 10 to 15 gr. (0.65 to 1.); Lassar's paste, 1 oz. (30.). This type of eczema is not infrequently secondary to large varicose veins, and ulcers formed by the breaking down of these veins. One of the best treatments for the latter condition is a combination consisting of 5 to 10 gr. (0.32 to 0.65) of resorcin, 5 to 10 gr. (0.32 to 0.65) of salicylic acid; lead plaster and petrolatum, each 4 dr. (15.). Creosote, 10 minims (0.6) may also be used to the ounce (30.) of petrolatum or paste.

Squamous eczema usually has to be treated with rather strong preparations, depending naturally upon the thickness and chronicity of the areas. The tar compounds, ammoniated mercury, calomel, salicylic acid, and the roentgen-ray work best in this type of outbreak. Liquor carbonis detergens is given in the strength of from 1 to 4 fl. dr. (4. to 16.) to the ounce (30.) of Lassar's paste, equal parts of lanolin and petrolatum, or in a lotion; a considerable amount of glycerin is placed in the latter, from 20 to 30 minims (1.3 to 2.), to prevent dryness and cracking of the surface treated. Oil of cade, 1 to 2 fl. dr. (4. to 8.) to the ounce (30.) of paste, or olive oil, and 2 minims (0.12) of menthol for the pruritus is also of marked benefit. Ammoniated mercury from 20 to 40 gr. (1.3 to 2.6) to the ounce (30.) of paste, or equal parts of Lassar's paste and petrolatum, applied to only a small surface to prevent the possibility of ptyalism, is often of benefit. Calomel from 30 gr. (2.) to a dram (4.) to the ounce (30.) may be employed. Salicylic acid for its softening effect upon the epidermis may be combined with any of these preparations in the strength of from 10 to 20 gr. (0.65 to 1.3) to the ounce (30.). The roentgen-rays applied to the extremely thickened patches, particularly those involving the palms and the soles, and occasionally to chronic subacute vesicular patches, is curative.

In the treatment of eczema of the scalp it should be remembered that pastes should be eliminated because of the difficulty in removing the starch from the hairs. Salves or lotions, therefore, should be employed. In very acute outbreaks with a considerable amount of oozing, a lotion of boric acid, 15 gr. (1.) to the fl. oz. (30.) of water; sodium borate, 3 gr. (0.18) alone or combined with 3 to 5 gr. (0.18 to 0.32) of resorcin; made up in witch-hazel, 1 fl. oz. (30.), is efficient; phenol, 5 to 8 minims (0.32 to 0.5) may be added for the itching. Boric acid, 20 to 30 gr. (1.25 to 2.) alone, or combined with ammoniated mercury 10 to 15 gr. (0.65 to 1.) to the ounce (30.) of petrolatum, cold cream, or benzoinated lard,

is helpful. In the thicker type of case with little or no oozing, the tar compounds in lotions, oils, or salves are of use in the strengths mentioned under papular eczema, also calomel and salicylic acid. The nails should be treated with salicylic acid, 10 to 20 gr. (0.65 to 1.3) to the ounce (30.) of a thin base, or with a combination of ammoniated mercury, 40 gr. to 1 dr. (2.6 to 4), to the ounce (30.) of the former preparation.

Certain rules should be applied in the external treatment of eczema. The crusts and scales should be thoroughly cleaned from the surface before the remedy is applied; as soap and water act as irritants in practically all forms of eczema, even the most chronic, the surface should be cleansed with petrolatum, olive oil, sweet oil, or oil of sweet almonds, or boric acid lotion. If crusting is a very marked feature starch poultices may be applied. Lotions should be mopped on and the other preparations should be applied gently and carefully to prevent irritation. Eczema rubrum of the lower extremity, particularly when associated with varicose veins and leg ulcer, should be treated by keeping the patients off their feet or at least as quiet as possible. When there is not too great oozing, cure is hastened in the latter type of cases by having the patient wear an elastic-web bandage to cause even pressure and constriction on the veins.

DERMATITIS SEBORRHEICA.

Synonyms.—Seborrhea corporis (Duhring), Eczema seborrheicum.

Definition.—*Dermatitis seborrheica* is an inflammatory disease of the skin attacking the scalp primarily, portions of the face, and particularly the hairy portions of the body, and is characterized by the development of patches with greasy scales.

Symptoms.—In a typical case the scalp exhibits reddish patches or a reddened condition involving the entire hairy surface. These areas are covered with greasy, yellowish scales. The hair is frequently dry and somewhat brittle, or may be quite oily. There may eventually be some falling of the hair. Although the disease may remain limited to the scalp, it frequently extends to the eyebrows, the eyelids adjoining the eyelashes, the alæ of the nose, the mustache area, over the sternum, between the shoulders, the axillæ, the pubic region, and, in extensive instances, the bends of the elbows and the popliteal spaces. Exceptionally the mucous membrane of the lips may be attacked (cheilitis exfoliativa), and not infrequently the entrance to the auditory canal and the umbilicus.

The patches are usually somewhat sharp in margin, of a pinkish to pinkish-red color, and covered with a greasy yellow scale, which sometimes more or less conceals the inflammatory character of the

outbreak. There is usually comparatively slight infiltration, the disease is in most instances dry, but irritation may cause oozing; itching is usually slight. The lesions may remain discrete or form confluent patches, some irregularly annular in formation.

Etiology.—Although digestive disorders have been mentioned by many as predisposing to an outbreak, in practically all cases that I have seen they have apparently exerted very little influence. The affection is of rather common occurrence, usually between the ages of twenty and forty years, and in both sexes. Unna considers the condition to be of parasitic origin, but so far no organism of the many found can be stated to be positively causal. Heat, friction, and moisture are apparently somewhat predisposing.

FIG. 37.—Seborrheic dermatitis of scalp and face. (Courtesy of Dr. G. M. MacKee.)

Pathology.—There is slight infiltration around the papillary and subpapillary vessels and along the hair follicles, while in the rete, the basal layer shows vacuolization and wandering cells. Some of the cells are degenerated. The coil glands are dilated. The horny layer is thickened.

Diagnosis.—The disease is to be differentiated from seborrhea, pityriasis rosea, eczema, ringworm, and psoriasis. Seborrhea of the dry form is limited to the scalp, and consists of grayish-white or yellowish, greasy scales, involving usually uniformly the entire scalp; there are no inflammatory signs present, which is absolutely opposite to the present condition with its redness, the patch forma-

tion, and its liability to attack other areas. Oily seborrhea may attack the face, particularly the nose, and the yellowish drops of sebaceous material are not observed in the present affection. Pityriasis rosea does not attack the scalp and face, and is limited to the trunk and the upper portion of the extremities, rather on the shoulders than in the armpits; the patches show practically no infiltration, the centers are of a fawn color and very slightly scaly; the disease runs a limited course.

Fig. 38.—Seborrheic dermatitis. Limited to the chest and upper back, with a little on face and a markedly scaly condition of scalp. (Courtesy of Drs. Fordyce and MacKee.)

Eczema is apt to show certain areas of oozing, is usually of not such a sharp margin, does not tend to start on the scalp, and then extends to the areas involved by seborrheic dermatitis, and is not covered by a greasy yellow scale; itches intensely.

Ringworm of the scalp occurs exclusively in children, consists of rounded patches, showing partial hair loss, prominence of the

follicles, broken-off hairs, a whitish scale, loosened hairs, and microscopically the presence of fungus. Ringworm only exceptionally attacks the areas involved by seborrheic dermatitis.

Psoriasis attacking the scalp exhibits thick red areas with silvery-white scales; it tends to be of generalized distribution with a predilection for the extensor surfaces, rather than the sites attacked by seborrheic dermatitis. In the former the face is free, or only shows involvement at the hairy margin.

Prognosis.—The disease usually responds readily to treatment, but tends to relapse.

Treatment.—Various preparations are curative when applied to the scalp, and in the male sex ointments should be used, while in the female lotions should be considered. An ointment consisting of precipitated sulphur, ½ dr. (2.); salicylic acid, 10 gr. (0.65); lanolin, 2 dr. (8.); cold cream, 5 dr. (20.), is probably the best. Ammoniated mercury, ½ dr. (2.), and sodium salicylate, 15 gr. (1.) to the ounce (30.) are also of use. Lotions consisting of resorcin, 10 gr. (0.65); salicylic acid, 10 gr. (0.65); castor oil, 2 minims (0.12); alcohol, 6 fl. dr. (24.); water, 2 fl. dr. (8.), are efficient; or bichloride of mercury, ⅛ to ½ gr. (0.008 to 0.03); acid salicylic, 5 to 10 gr. (0.32 to 0.65); glycerin, 10 minims (0.65); spirits vini rect. 6 fl. dr. (24.); camphor-water, 2 dr. (8.); or liquor carbonis detergens, 1 to 1½ fl. dr. (4. to 6.); castor oil, 10 minims (0.65); alcohol, 85 per cent 1 fl. oz. (30.). Liquor carbonis detergens, 1 to 1½ fl. dr. (4. to 6.); salicylic acid, 10 to 15 gr. (0.65 to 1.); lanolin and petrolatum each 4 dr. (16.). The ingredients of the various preparations should naturally be reduced in strength in very inflammatory cases or where the skin is unusually sensitive.

In the treatment of the lesions on the cutaneous surface exclusively the remedies have to be employed very much weaker; in most instances a sulphur or sulphur and salicylic acid ointment is the most efficient; precipitated sulphur, 10 to 20 gr. (0.65 to 1.3); salicylic acid, 8 to 12 gr. (0.5 to 0.8); lanolin, 2 dr. (8.); cold cream, 6 dr. (24.); this preparation can at times be advantageously thickened with ½ to 2 dr. (2. to 8.) of bismuth subcarbonate to the ounce (30.). Ammoniated mercury or calomel may be used from 10 to 15 gr. (0.65 to 1.), either alone or combined with from 6 to 10 gr. (0.36 to 0.65) of salicylic acid; lanolin 2 dr. (8.); benzoinated lard, 6 dr. (24.). A sulphur lotion, consisting of zinc sulphate and potassium sulphuret is efficacious because of the precipitate thrown down by the combination of these two incompatible drugs.

℞—Zinci sulphatis . . . . . gr. xx 1|3
Aquæ . . . . . f℥ij 60|

M. et adde

Potassæ sulphuretæ . . . . . gr. xx 1 3
Aquæ . . . . . q. s. ad f℥iv 120.

M.

In certain instances ointments are not well borne. Under these circumstances either of the two following lotions are efficient: Resorcin, 5 to 8 gr. (0.32 to 0.5); bismuth subcarbonate ½ dr. (2.); water, 1 fl. oz. (30.); or boric acid, 15 gr. (1.); bismuth subgallate, ½ dr. (2.); glycerin, 8 to 10 minims (0.5 to 0.6); camphor-water, 1 fl. oz. (30.).

For the patches of seborrheic dermatitis occurring on the eyelids, at the border of the eyelashes, a boric acid lotion should be used several times daily, and at night the yellow oxide of mercury, 4 gr. (0.25); cold cream, 1 oz. (30.). Applications to the lips should be half the strength of the preparations applied to the cutaneous surface. Soap and water should be used cautiously on the affected areas, and in the event of irritation should be excluded.

HERPES SIMPLEX.

Synonym.—Fever blisters.

Definition.—A disease characterized by groups of vesicles occurring chiefly on the lips and the lower portion of the face.

Symptoms.—The outbreak consists of pin-head- to pea-sized vesicles, frequently on an erythematous base, arranged in groups, which may be bilaterally situated, usually in the vicinity of or involving the mucous membranes of the lips. There may be only one or several groups of vesicles. Practically any portion of the cutaneous surface may be attacked, but the outbreak is usually observed upon the face. There may be a preliminary feeling of heat or burning in the part to be attacked, or the vesicles may appear without previous sensation. The lesions tend to break and to form into crusts. The affection lasts from a few days to a week. There is frequently a tendency to recurrence.

Lesions may not only be observed on the buccal mucous membranes but also on the gums, in the mouth, on the hard and soft palate, the tonsils, the roof of the mouth, the tongue, within the nose, the larynx, the pharynx, the esophagus, the vagina, and the urethra.

Groups of vesicles may develop in certain individuals at each menstrual period, either on the vulva, within the vagina, or elsewhere on the body. Herpes simplex is frequently observed in croupous pneumonia, in cerebrospinal meningitis, in malaria, at times in influenza, in typhoid fever, and rarely in variola, in scarlet fever, and diphtheria.

A disease has been described, known as *herpetic fever*, in which severe constitutional symptoms have been present, numerous groups of vesicles, not only on the lips but on other portions of the face, and in a few instances on the extremities, in the throat, and

on the larynx. Large epidemics of the affection have occurred in schools. (Seaton, Savage.)

Fig. 39.—Herpes simplex (fever blisters). Extensive and very inflammatory.

Fig. 40.—Herpes simplex. Rather unusual location and a large number of vesicles.

Herpes frequently is observed on the genital region in both women and men.

Etiology.—Herpes facialis is frequently associated with colds and also digestive disorders. Long exposure to the sun, particularly when on the water, is provocative of an outbreak. Dental irritation is at times apparently causative. Certain articles of diet may predispose to an outbreak, as the eating of cheese.

Herpes progenitalis or genital herpes may be caused in the male by the irritation of a long foreskin, or too frequent sexual indulgence. Some men have an outbreak after every coition with their wives. Injuries and surgical operations predispose to an outbreak. Some women have an attack of herpes at each menstrual period, pregnancy, or the puerperal state. Prostitutes are prone to an attack, according to Unna, because of congestion and great vasomotor irritation. Various etiological conditions which have been mentioned as causing the condition, in the male or female, are uncleanliness, decomposing secretions, hot weather, obesity, rape, and in certain instances venereal disease.

Pathology.—The vesicles develop from the elevation of the pathological prickle-cell layer and from the swollen papillary body. The cavity is almost entirely subepithelial. The whole process has to do with a fibrinous inflammation of the epidermis. The primary changes affect the older, superficially lying prickle cells. The epidermis loosens from the swollen papillæ and a subepithelial blister develops, the covering of which is the stretched prickle-cell layer.

Diagnosis.—The patches of vesicles, discrete in character, and which usually involve the mucous membranes of the lip and the skin in the vicinity, could hardly be mistaken for the oozing, confluent, thickened, reddened patches of vesicular eczema, or for the discrete honey-colored crusts of impetigo contagiosa, which rarely attack the mucous membranes. Herpes zoster can be easily differentiated because of its unilateral distribution; the lesions are located along the course of the nerve; the tense vesicles which do not tend to rupture spontaneously but dry up; and the severe pain.

Prognosis.—The affection runs a course of but a few days to a week. There is, however, a tendency in certain instances for the outbreak to recur, particularly in the genital variety.

Treatment.—Internal treatment is not indicated, excepting symptomatically, such as for coryza and for digestive disturbances. Certain articles of food which produce an attack in those having a certain idiosyncrasy should be excluded.

The attack may at times be aborted in the beginning by the frequent application of alcohol or spirits of camphor. In the

treatment of the outbreak, boric acid 15 gr. (1.), and equal parts of alcohol and camphor-water to make 1 oz. (30.) is efficient. Ointments may also be used, consisting of menthol 2 gr. (0.12); boric acid 20 gr. (1.3); petrolatum 1 oz. (30.); or the preparation may be thickened with 1 dr. (4.) of powdered zinc oxide. If there is a considerable amount of crusting ammoniated mercury, 10 gr. (0.65); bismuth subcarbonate, 1 dr. (4.); cold cream, 7 dr. (28.), may be employed.

In treating *herpes progenitalis*, cleanliness is the first indication. The parts should be washed several times daily with warm water and a mild soap. Dusting powders containing boric acid, ½ dr. (2.); calomel 10 to 20 gr. (0.65 to 1.3); powdered zinc oxide, 1 dr. (4.); powdered talcum 1 oz. (30.), is of use; or a lotion containing boric acid, 15 gr. (1.); powdered zinc oxide, ½ dr. (2.); witch-hazel, 1 fl. oz. (30.).

The recurring type of herpes is frequently difficult to cure permanently; arsenic in the form of Fowler's solution 3 to 5 minims (0.18 to 0.3), three times daily, may be of use. Galvanic electricity, the positive electrode being placed over the lumbar region and the negative applied to the affected area, and of the strength of ½ to 2 milliampères, may prove useful.

HERPES ZOSTER.

Synonyms.—Shingles; Zona; Zoster; Ignis sacer.

Definition.—An acute inflammatory self-limited disease, characterized by the development of groups of vesicles on an inflamed base, unilaterally distributed, and following the course of one or more cutaneous nerves.

Symptoms.—The attack may be ushered in with pain of a neuralgic character, which precedes the outbreak by a few days, a few hours, or appears synchronously with the eruption. There may also be chilliness, malaise, slight fever, or nausea, or all symptoms of every kind may be absent. The pain may continue during the course of the affection or, particularly in childhood, is entirely absent. Groups of pin-point- to split-pea-sized vesicles develop on an inflamed base following the course of one or more of the cutaneous nerves or their branches. The vesicles are tense, their walls quite thick, the contents clear, and they do not tend to break, unless accidentally ruptured, but dry up, forming yellowish-brown crusts. The lesions tend to remain discrete, but exceptionally may run together and form small bullæ. In a few instances the contents become purulent or hemorrhagic; small scars frequently remain at the sites of the former lesions. Rarely ulceration or gangrene occur.

The outbreak is almost universally unilateral, and the chest

and back usually show the lesions; the right side is most often attacked. The palms and dorsal surface of the hands are rarely

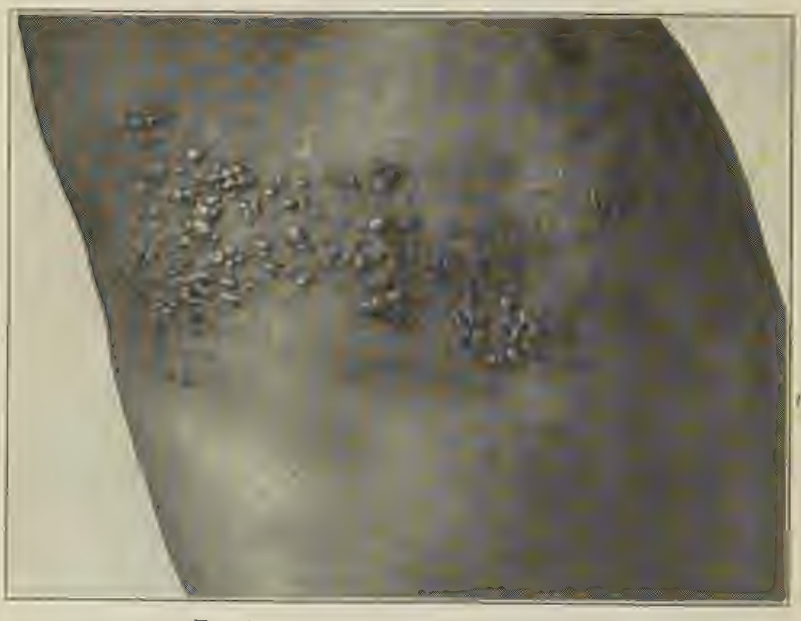


FIG. 41.—Herpes zoster. Typical location.

FIG. 42.—Herpes zoster. Typical groups of vesicles, developing on and adjoining a scar from a burn.

affected; the fingers, soles of the feet, scrotum, and penis are usually exempt. Zoster attacking the forehead may also involve the upper

eyelid and extend to the eye, causing corneal involvement and eventually interference with vision.

In certain instances the mucous membranes may show involvement, such as the lips, the inner surface of the cheeks, the tonsil, the tongue, the bulbar conjunctiva, and the cornea.

The disease runs a course of a few days to two weeks. In a few cases the lesions remain quite small, of an abortive character, and dry up without reaching full development. Exceptionally pain, tenderness, burning, or itching may remain at the site of an attack for a considerable length of time after the lesions have disappeared. In such instances it is rather difficult to eradicate the paresthesia. The outbreak is apt to occur during the spring and summer months.

Etiology.—Zoster is a disease of early life. In 286 cases observed by the writer, the majority appeared between the tenth and thirtieth years; the youngest at four months and the oldest at seventy-eight. Crocker found three-quarters of his patients under twenty years of age and two-thirds of these under thirteen. Males are more frequently attacked; 205 out of the above number. Race and occupation have no etiological significance.

Numerous predisposing causes have been mentioned, such as exposure to draughts, various depressing agencies, such as certain poisons, carbon dioxide, belladonna, atropin, pyemia, carcinoma, fever, measles, pulmonary inflammations, septicemia, hemorrhages, traumatism, malaria, puerperal eclampsia; and spinal injections, vaccination, the passage of electrical currents, the extraction of teeth and dental caries, pricking with thorns, gunshot wounds, and tapping of hydatid cysts. Any influence sufficient to induce inflammation of a sensory nerve or its ganglion may be followed by an outbreak. Several operations upon the Gasserian ganglion have been followed by an attack. Some authorities consider that zoster is an infectious disease. The administration of arsenic has been provocative of an outbreak in quite a number of instances.

Pathology.—The disease is usually a descending acute neuritis. It usually starts in the ganglionic system, in the cervical or spinal ganglia, finally reaching the terminal branches with the production of the eruption. Investigations point to a relationship between the tender areas of visceral disease and the patches of the zoster. In most cases the ganglia show softening, enlargement, and inflammation. In the traumatic cases the ganglia are not involved, the peripheral nerves alone being the seat of the pathological changes. Apparently anything which may bring about an irritable or inflamed state of the Gasserian ganglion, spinal ganglia, nerve tract or peripheral branches may be responsible for the eruption. (Head and Campbell.)

The changes in the skin are usually found in the rete layer of

the epidermis; the cells lose their prickles and are found free and loosely heaped together at the base of the blister. They lose their protoplasmic character, also their consistency, and become of varied and unusual form. Unna has suggested the term "ballooning" for their curious shapes. Certain observers have suggested that they are an organismal cause of the affection rather than a degenerated type of epithelial cell. The base of the vesicle consists of the uncovered papillæ. The liquid content is formed chiefly interepithelially. The large cavities are filled with fibrin, leukocytes, epithelial nuclei, and fragmented leukocytic nuclei. There is also an emigration of leukocytes from the vessels into the papillary body and dilatation of these channels, also swelling of connective-tissue cells. The inflammatory area extends only the breadth of a few papillæ beyond the vesicle, and above this small inflamed halo the epidermis is hardly altered. The whole cutis only shares in the process in purulent and hemorrhagic zoster.

Diagnosis.—The affection could hardly be mistaken for any other eruption if the unilateral character of the outbreak, the grouped vesicles on an inflammatory base, the acute course of the affection, and the associated pain are considered. Herpes simplex usually is bilaterally distributed, the face in the neighborhood of the mouth being commonly involved. There are no subjective symptoms of pain, and there is a tendency for the blisters to break and form a crust. Eczema does not show the unilateral distribution following the course of a cutaneous nerve and the discrete arrangement; there is no pain but severe itching.

Prognosis.—The prognosis is favorable, as the affection runs an acute self-limited course. In attacks in the neighborhood of the eye, corneal ulceration may result and vision may be interfered with. Destruction of the organ may exceptionally occur, and possibly septic infection, meningitis and death. In a few instances persistent neuralgia or other sensory or motor disturbances may result.

Treatment. The mild cases, particularly those attacking children in which there is very little pain or an absence of the same, require only local remedies; in most instances internal preparations are indicated to alleviate the pain. The milder analgesics are usually sufficient, and chloral, sulfonal, or morphine are rarely required. The remedies frequently of use are antipyrin, phenacetin, codein, salol, camphor monobromate, and caffein citrate. The following prescription is extremely useful:

℞—Acetanilidi	ʒj	4	
Camphoræ monobromat.	gr. xx	1	3
Caffeinæ citratis	gr. vj		36

M. et ft. caps. no. xx.
Sig.—One every three hours.

Locally, alcoholic lotions, dusting powders, or pastes are of use. The following combinations are helpful: Menthol, 4 gr. (0.25); acid boric, 1 dr. (4.); alcohol, 4 fl. oz. (120.); menthol, 2 gr. (0.125); powdered bismuth subcarbonatis, powdered starch, of each 2 dr. (8.); petroleum, ½ oz (15.); and a dusting powder consisting of camphor, 20 gr. (1.3), acid boric, 1 dr. (4.); powdered talcum, 1 oz. (30.). Although certain dermatologists have employed flexible collodion or ichthyol, they offer no benefits over the treatment suggested. In the outbreak on the eyelids or near the eyes use only a saturated solution of boric acid locally.

In those cases in which paresthesia follows an outbreak, tonic or alterative treatment is given internally. Quinine, strychnine, and arsenic have been given. Locally the stimulating effect of static, galvanic, and faradic electricity, and even mild applications of roentgen rays may ameliorate the troublesome symptoms.

HYDROA VACCINIFORME.

Synonyms.—Recurrent summer eruption (Hutchinson); Hydroa estivale; Hydroa puerorum. (Unna.)

Definition.—A recurring summer eruption attacking young individuals usually of the male sex, and characterized by the development of vesicles, chiefly on the exposed portions of the body, and followed by scarring.

The disease was first described by Bazin in 1861.

Symptoms.—The eruption is apt to be symmetrically distributed on the nose, the cheeks, the ears, and the backs of the hands, and is preceded by mild constitutional symptoms. The general surface may be exceptionally involved. An herpetic keratitis may at times be associated with the cutaneous outbreak. The disease occurs in successive attacks, each lasting for two to three weeks. A few days or several weeks may intervene between outbreaks. The sensation of heat or itching may precede or accompany the eruption. The first lesions observed are red macules or elevations upon which vesicles, from a pin-head to split-pea in size, appear either singly or in groups; these may coalesce and be surrounded by a red halo. The vesicles may dry up or rupture and form a crust, and umbilication resembling a vaccination vesicle is observed. The umbilicated center is black or dark blue in color, and is surrounded by a ring of fluid, with an encircling red areola. The contents of the vesicles may be clear, milky, or purulent. A black, adherent crust may form, which leaves a reddened, depressed scar which eventually turns white. The vesicle runs a course of three or four days.

Etiology.—The disease usually begins during the first three or four years of life and almost always in the male sex. The disease

is observed during the summer months, active manifestations of it usually being absent in the winter. Exposure of sensitive skins to the sun and the wind is apparently causal. Certain actinic rays, as demonstrated by Ehrmann, are causative. According to Hyde, sunlight reflected from the snow in winter may cause an attack.

Pathology.—The process is of an inflammatory character, beginning in the rete and upper corium. Edema and cellular infiltration may be observed in the papillary layer, and necrosis at times extends deeply into the corium and subcutaneous tissue.

Diagnosis.—The time of development, the age of the individual, the character of the outbreak and its course should offer a clear differentiation from other conditions.

Prognosis.—This is unsatisfactory. The approach of puberty apparently is the only curative factor.

Treatment.—The patient should be guarded from sunlight and winds as far as is possible, and all irritants avoided. Internally, arsenic may be tried, usually, however, without effect. Crocker has reported favorable results from the use of salicin in 15 gr. (1.) doses, three times daily. The latter suggests early puncture of the lesions to avoid, if possible, scarring. Mild ointments or lotions are employed such as have been mentioned under the acute forms of eczema.

PROGRESSIVE PIGMENTARY DERMATOSES.

Schamberg, in 1901, described an affection characterized by the development of pin-head-sized reddish spots which form irregular patches, and slowly spread by the formation of new lesions at the periphery. The patches are irregular in shape, smooth, and non-elevated. The process is extremely slow but eventually the lesions disappear, leaving behind brownish-yellow or reddish-brown pigmentations which slowly fade. The case originally reported occurred in a boy aged fifteen years, upon the wrists and the lower legs. The pathological changes were found in the corium. No pigment cells or free pigment granules were found. Treatment was without avail.

POMPHOLYX.

Synonym.—Cheiropompholyx (Hutchinson); Dysidrosis (Tilbury Fox).

Definition.—An unusual acute inflammatory vesicular and bullous disease which attacks the hands and feet. The affection was first described by Tilbury Fox in 1875, and independently by Hutchinson.

Symptoms.—The outbreak almost invariably occurs on the hands and the feet, and although frequently symmetrical in distribution, one side is often more severely involved than the other. The palmar and plantar surfaces are more apt to be attacked than the dorsum of the extremities. The eruption is accompanied by burning and tingling, and is characterized by the development of pin-head to pea-sized, deeply embedded, boiled sago grain-like vesicles, which occur singly or in groups along the sides of the fingers and on the palms; the whole surface of the hands may, however, be involved. When the vesicles are grouped they frequently coalesce into large bullæ which are elevated above the level of the skin.

The contents of the vesicles are neutral or alkaline in reaction, in the early stages clear, and later turbid. The vesicles do not tend to rupture spontaneously, and usually become absorbed in from ten days to two weeks, and the skin may then exfoliate. Patients with the affection are observed to have hyperidrosis; sweating of the hands develops during and previous to an attack. There is a tendency for new lesions to appear over some days, weeks, or months.

Etiology.—The affection is of unusual occurrence. It is observed at an early age, but infrequently in children or those of advanced years. The outbreak usually occurs with the advent of warm weather in the late spring or summer, and tends to recur each year. Attacks are most frequently observed in those in a lowered state of health or nervously deranged. Therefore worry, fatigue, or exhaustion may predispose to the eruption. Women are more apt to be attacked. Some consider that it is a neurosis, while Unna believes it is of bacillary origin.

Pathology.—Those originally investigating the disease believed that it had some connection with the sweat glands; later investigators found no such relationship, but indicated that it is a mild inflammatory affection. The lesions take their origin in the rete layer, the fluid is derived from the papillary bloodvessels. Some of the prickle cells are degenerated, and others pushed aside to give space for the collection of fluid. The serum may also be found in the horny layers. Pus corpuscles, fibrin, and albumin are also present.

Diagnosis.—Vesicular eczema and dermatitis can be easily distinguished, as they are much more inflammatory in character; the vesicles tend to break; the outbreak is not of such a limited distribution; oozing is a marked symptom; there are more lesions, a greater tendency to close grouping and confluence, and itching rather than burning is present.

Prognosis.—The attack tends to run a comparatively short course, but recurrences are apt to develop.

Treatment.—The patient should ingest plenty of good, plain, nourishing food, take plenty of time for meals, and have sufficient sleep. Nervous strain and worries should be eliminated as far as it is possible. Tonic treatment is frequently indicated; iron, quinine, strychnine, and cod-liver oil may be used. Arsenic has proved very beneficial in my cases in the form of Fowler's solution 5 minims (0.3), three times daily, or arsenic trioxide $\frac{1}{25}$ gr. (0.0025) after each meal.

Locally ointments, pastes, or lotions are employed; stimulating preparations rather than those which are milder. The following prescriptions are recommended. In those cases with a rather inflammatory aspect an ointment containing phenol, 8 gr. (0.5);

Fig. 43.—Pompholyx lesion one week old. (Courtesy of Dr. R. L. Sutton).

menthol, 3 gr. (0.18); salicylic acid, 5 to 10 gr. (0.32 to 0.65), powdered zinc oxide and powdered starch, each 1 dr. (4.); petrolatum, 6 dr. (24.); in those less inflamed, liquor carbonis detergens, 15 to 30 minims (1. to 2.); powdered zinc oxide $\frac{1}{2}$ dr. (2.), glycerin, 15 minims (1.); camphor-water 1 fl. oz. (30.); and those of the least inflamed type, the prescription used by Dr. C. N. Davis: acid salicylic and resorcin of each $\frac{1}{2}$ dr. (2.); alcohol 1 fl. oz. (30.).

The latter preparation is painted on the lesions with a camel's-hair brush once or twice daily for a few days to a week; the surface and vesicles are then dried up and the epidermis exfoliates, and the lesions are cast off also. If the surface is inflamed by this method the soothing ointment first mentioned is applied.

Roentgen-ray exposures are frequently of use.

DERMATITIS REPENS.

Definition.—A rare spreading dermatitis, following an injury, commencing on the upper extremities, and characterized by a serous undermining of the epidermis.

The affection was first described by Crocker in 1888.

Symptoms.—Redness and serum develop, or vesicles and bullæ may first appear which become confluent; the skin breaks, and there is a gradual peripheral undermining of the epidermis, with a spread of the involved area. When fully developed the patch has a red, raw-looking, oozing surface, with an elevated, spreading vesicular

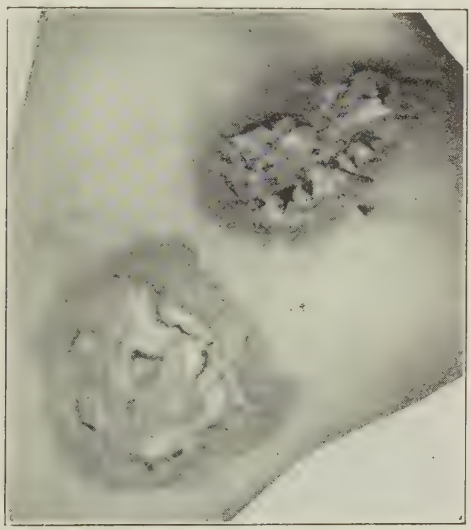


FIG. 44.—Dermatitis repens. (Courtesy of Dr. R. L. Sutton.)

circumference, and is at times crusted. The central part of the patch tends to become dry, healed, and with an atrophic appearing surface. The disease almost invariably starts on the fingers or the hands, and may be somewhat limited in extent, or traverse the entire arm and spread to the trunk. The course of the condition is usually slow, and there is no tendency to spontaneous cure.

The French have described a closely allied condition termed *acrodermatitis perstans* (acrodermatites continués) characterized by a vesicular or pustular outbreak developing on one finger and subsequently by the appearance of fresh foci on the other fingers, in the vicinity of the nail, and on parts of the hand. Erythemato-squamous patches may also be observed upon the trunk.

Etiology.—Probably a peripheral neuritis induced by a slight injury, such as a cut or burn, is the starting-point of the affection. A parasitic invasion has also been mentioned as causal, possibly occurring through a traumatic break in the continuity of the cutaneous surface.

Diagnosis.—The disease spreading by an undermining of the epidermis, the location and the traumatic origin offer a sufficiently clear picture to easily differentiate it from an eczema or pompholyx.

Prognosis.—Eventual cure has been obtained in all instances, but the affection is frequently rebellious to treatment. The prognosis in acrodermatitis perstans is not so favorable.

Treatment.—The mild application suggested in eczema should first be employed. In obstinate cases the remedies recommended by Crocker should be used; a 10 per cent solution of permanganate of potash is painted on the surface daily and allowed to dry, the undermined epidermis previously having been excised. In those cases in which other methods have failed, Unna's salicylic acid and creosote plaster was applied to the edge of the lesion to facilitate the softening and removal of the scaly collar.

EPIDERMOLYSIS BULLOSA.

Synonyms.—Epidermolysis bullosa hereditaria; Congenital traumatic pemphigus; Acantholysis bullosa.

Definition.—A rare disease characterized by the development of bullous lesions at the site of injury. The affection was described by Tilbury Fox in 1879, but was more clearly differentiated by Goldscheider three years later.

Symptoms.—The tendency is observed in early infancy for large or small bullæ to develop at the site of the slightest trauma. The parts most exposed to injury show the involvement most markedly. Occasionally the mucous membranes exhibit an outbreak. The lesions usually disappear without trace; at times, however, some pigmentation and slight scarring results. In certain instances an atrophic condition or shedding of the nails is noted.

Etiology and Pathology.—The affection is of hereditary origin and a history is at times obtainable of antecedents having had the same tendency. Traumatism is the direct cause of the outbreak.

Engman found an absence of elastic tissue in the papillary and subpapillary portions of the corium; elastic-tissue fibers were sparsely distributed and deformed in the deeper portions of the normal skin.

Diagnosis.—The disease could hardly be mistaken for any other affection if the time of development, the traumatic origin, and the course are considered.

FIG. 45.—Epidermolysis bullosa. (Fordyce and MacKee.)

FIG. 46.—Epidermolysis bullosa. (Fordyce and MacKee.)

Prognosis.—The affection runs in most instances during the life of the individual. In a few instances the tendency to traumatic bullous formation may later in life be somewhat lessened.

Treatment.—Treatment is practically without avail. Numerous internal preparations, including arsenic, have been administered. The parts should be shielded from injury, and locally mild lotions or ointments applied to the injured surfaces.

DERMATITIS HERPETIFORMIS.

Synonyms.—Hydroa bulleux (Bazin); Hydroa herpetiforme (Tilbury Fox); Duhring's disease; Dermatitis multiformis (Piffard); Herpes gestationis; Pemphigus pruriginosus; Herpes circinatus bullosum (Wilson); Herpes circinatus (Rayer); Herpes phlyctænodes (Gilbert); Pemphigus prurigineux (Chausit, Hardy); Pemphigus composé (Devergie); Dermatite polymorphe, Dermatite herpetiforme (Brocq).

Definition.—A rare inflammatory disease, tending to run a chronic course, and characterized by the development of groups of vesicles or bullæ, at times of an erythematous, papular, pustular or mixed type, and usually accompanied by severe itching.

Symptoms.—There may be slight constitutional symptoms, consisting of malaise and chilliness, at the first appearance of the affection or upon the development of subsequent attacks or exacerbations. Sensations of burning and itching may precede the exanthem by some hours, a day or more. The lesions consist of macules, papules, tubercles, vesicles, bullæ, and rarely a purpuric outbreak, and a combination of these. There is a distinct tendency for the lesions in one attack to be of a certain type, and in subsequent relapses of an entirely different variety. All phases of the disease show the marked characteristic of group formation. In most cases the affection is of a vesicular or bullous variety, with an arrangement resembling herpes.

The vesicles are flat, slightly elevated, hard, angular, irregular in outline, of a pale yellow to a reddish color, developing upon an inflamed base or with an inflammatory areola, and from pin-head to pea in size. Bullæ vary from a bean to the size of a pigeon's egg, with cloudy purulent, or exceptionally hemorrhagic contents. Pustules have the same characteristics as the vesicles, excepting for their purulent contents. The lesions may form in the shape of a segment or complete circle, and the groups cover small or large surfaces. The extremities usually show the greatest involvement; the face and the trunk, however, are frequently attacked, and the outbreak may be generalized. Pigmentation and infiltration of

PLATE V

Dermatitis Herpetiformis.

Duration one year. Patient aged fifty years.

the skin may be observed. The itching is marked at all stages of the affection, particularly at the time of appearance of new lesions.

In grave cases, crusting, lymphangitis, and secondary pus infection from scratching are noted. Nutritional changes are exhibited in the nails and at times these may be shed. Ulceration, scarring, vegetations, cachexia, and serious derangements of the nervous system may develop.

The affection in childhood is of infrequent occurrence, as but 57 cases could be discovered in the literature by the writer up to 1907. The prodromal symptoms in these cases were mild or absent; the lesions most often were vesico-bullous, usually generalized; the face and the extremities exhibited the greatest involvement; the tendency to grouping was absent, there was very little itching, and pigmentation was rarely noted.

Etiology.—The disease is observed in both sexes and usually in young adults. The patients are frequently of a neurasthenic type or with a lowered tone of the nervous system. Mental crises, nervous shock, fright, anger, menstrual irregularities, pregnancy, the puerperal state, septicemia, toxemias, phimosis, physical fatigue, exposure to cold, decreased intestinal or renal elimination have all been cited as causal or predisposing to an outbreak. Engman found the constant presence of indican in the urine. Hematoporphyrin has also been found. Autointoxication has been associated with the development of the disease in some instances.

Pathology.—The process begins in the papillary layer of the corium or in the deeper portions of the epidermis. There is edema, dilatation of the vessels, and masses of lymphocytes or plasma cells in the corium. Eosinophiles are found in the corium, the epidermis, the vesicles, the bullæ, and in the blood. The lesions consist of a fibrinous net-work, containing a large number of polymorphonuclear and epithelial cells, and coagulated albumin, in addition to the eosinophiles.

Diagnosis.—The disease has to be chiefly differentiated from pemphigus and erythema multiforme. The lesions of pemphigus are larger, always of a bullous type, do not tend to form in groups, are unaccompanied by itching, and the constitutional symptoms are more severe. Erythema multiforme tends to attack the dorsum of the hands, the wrists, the ankles, and the feet, it runs an acute, more or less self-limited course, is usually observed in the spring and the autumn, and is not accompanied by itching. Eczema and urticaria can be easily distinguished; the former by the lack of herpetic grouping and the presence of oozing, redness, and patchy formation; and the latter by the presence of wheals, to the exclusion of other lesions.

Prognosis.—The disease runs a persistent course, alternating in betterment and the appearance of a fresh outbreak. The individual may be practically free of eruption for weeks, months, or years, but in most instances a few lesions continue to appear as a constant reminder of the presence of the affection. Relapses or exacerbations of the affection are usually ameliorated in a few weeks, a month or more. The general health frequently remains unimpaired. A few cases have ended fatally, especially in those associated with septicemia or from intercurrent diseases.

Treatment.—The internal remedies administered in this disease are those that have more or less influence on the nervous system. The preparations employed are arsenic, which is the most efficient drug, quinine, strychnine, phenacetin, antipyrin, and salicylate of soda. Cod-liver oil, diuretics, and purgatives also have a place in the treatment of these cases. Arsenic frequently has to be given in ascending doses to the point of tolerance, depending upon the rapidity of response to the medication. In certain cases the eruptive phenomena can be ameliorated by moderate doses; Fowler's solution, 5 minims (0.3), three times daily, or arsenic trioxide, $\frac{1}{30}$ to $\frac{1}{20}$ gr. (0.002 to 0.003), after each meal are usually administered. A combination of $7\frac{1}{2}$ gr. (0.5) of antipyrin and 10 gr. (0.65) of the salicylate of soda, in a teaspoonful (4.) of peppermint-water, and well diluted in water, given three times daily, is of use. The patient should be carefully examined, and any derangement of the general economy should be treated symptomatically.

Locally, mild lotions, salves, or dusting powders should first be prescribed, and later those with stronger ingredients. Phenol, 1 fl. dr. (4); bismuth subcarbonate, 2 dr. (8.); glycerin 1 dr.; lime-water, 4 fl. oz. (120.), is of use; an ointment containing menthol, 2 gr. (0.12); zinc oxide, 2 dr. (8.); petrolatum, 6 dr. (24.); or a dusting powder consisting of phenol, 5 minims (0.32); camphor, 10 gr. (0.65) boric acid, 1 dr. (4.); powdered talcum, 7 dr. (28.). The most efficient remedy in many instances of the affection is liquor carbonis detergens, starting with a strength of $\frac{1}{2}$ fl. dr. (2.) to the fluidounce (30.) of camphor-water, and increasing up to even the undiluted preparation, if the patient's skin is unirritated. Frequently the addition of zinc oxide, $\frac{1}{2}$ dr. (2.) to the ounce (30.) of the last preparation makes a more agreeable application. Duhring recommended a sulphur ointment: $\frac{1}{2}$ to 1 dr. (2. to 4.) to the ounce (30.) of petrolatum, in the vesicular, vesiculo-bullous, and pustular types of the affection.

PEMPHIGUS.

Definition.—A rare acute or chronic disease characterized by the development of bullæ which usually arise from the sound skin,

tending to form in successive crops, and accompanied by mild or severe constitutional symptoms.

Pemphigus may be divided into *pemphigus acutus*, *pemphigus chronicus*, *pemphigus foliaceus*, and *pemphigus vegetans*. Certain descriptive terms have also been applied to the affection, such as benignus, malignus, gangrenosus, hemorrhagicus, etc.

FIG. 47.—Pemphigus vulgaris; some years' duration.

Symptoms,—*Acute Pemphigus.*—The outbreak comes out suddenly with symptoms of malaise, fever, chilliness or rigors, or an absence of systemic disturbance. The attack is characterized by the development of pea- to pigeon's-egg-size or larger bullæ, distended or somewhat flattened. The lesions are frequently numerous and irregularly distributed over the surface, and appear in rapid succession or in crops, and usually develop from the sound skin. The contents tend to be clear in the beginning and later opaque or hemorrhagic, and in rare instances gangrenous.

In grave instances, constitutional symptoms become aggravated, the throat and mouth show extensive involvement, the bullæ become flaccid and puriform, the surface gangrenous, and death

results. In milder cases, the blebs disappear by absorption, desiccation, and crusting, and scarring does not result.

Chronic Pemphigus (*Pemphigus Vulgaris*).—The most of the cases observed are classed under this heading. The affection runs a long course, the bullæ continuing to appear. The skin generally shows a few lesions, although there may be intervals of complete freedom. The blebs may appear singly or develop in crops. Cycles of attack may be noted, single lesions appearing each day over a course of some days or weeks, and then there is a numerous crop of fresh bullæ. The mouth and throat frequently exhibit blebs. The conjunctivæ are exceptionally attacked. Blood may be mixed with the contents of the bullæ in some instances. The lesions heal by crusting; pigmentation may result, but no scarring.

Constitutional disorders are absent in mild cases and may be very severe in grave instances. Fever and chilliness may precede or accompany the original outbreak, and continue throughout the course of the affection, or be observed chiefly at the time of the exacerbations. Burning and soreness are at times complained of, but itching is either absent or very mild.

Pemphigus Foliaceus.—This phase of the disease is exceedingly rare, and may have its diagnostic feature from the beginning or develop from an acute or chronic pemphigus. The blebs form rapidly and tend to dry into a crust before fully distended, or are flaccid and flat, become purulent, break or are accidentally ruptured, and there is a purulent undermining of the epidermis. The cutaneous involvement is either extensive or generalized. The skin surface shows flaccid, slightly elevated, seropurulent or purulent blebs, with distention of the dependent portions by fluid; ruptured lesions with an undermining of the surrounding epidermis; thin crusts with exudation beneath, and large, red, raw, oozing surfaces. Certain portions of the skin may be dried and thickened, and fissures may develop around the joints.

In severe instances the nails and hair are brittle and at times shed, and the mucous membranes and conjunctivæ are involved. Constitutional symptoms may be severe.

Pemphigus Vegetans (Erythema Bullosum Vegetans (Unna).—This type of pemphigus is quite rare and was first described by Neumann in 1886. The attack usually starts with mucous membrane involvement; the mouth, throat, or lips exhibit whitish or reddish plaques and bullæ The usual type of pemphigus bleb may be observed on the integument and follow the typical course of these lesions; others, on the warm and moist portions of the body, the genital, anal, and axillary regions, crust; the surface becomes inflamed, edema is noted, a viscid, offensive secretion appears, and finally papillomatous- or condyloma-like vegetations develop. Fever frequently accompanies an outbreak.

Etiology. -Pemphigus is extremely rare in this country, particularly the acute form, the vegetating and foliaceous varieties. It may occur in both sexes and at any age; the acute type is apt to be observed in early life. It is not hereditary.

Acute pemphigus has been observed in young girls with menstrual disorders. It has followed sepsis, vaccination, rheumatic and other fevers, diphtheria, the exanthemata, and even long confinement in poorly ventilated rooms, and from puerperal processes in the mother. Animals and their products have been causal, particularly from wound infections, in butchers and those handling meats. The similarity to the "foot and mouth disease" of cattle has been mentioned.

The other types of the affection have been attributed to nervous influences, such as hysteria, functional nervous disorders, peripheral nerve injuries, diseases of the central nervous system, degenerative changes of the peripheral nerves and nerve centers, and autointoxication.

Bacteriological influence has been mentioned as causal in the various varieties of the affection, particularly the acute type. Cocci have been found in a considerable number of instances, particularly diplococci and streptococci, and the Bacillus pyocyaneus has also been isolated.

Pathology.—Eosinophiles have been found in large quantities in the blood and also in the bullæ, and at times there is a diminution in the number of red blood cells.

The changes in the skin depend upon the degree of inflammation and the stage of bullous development. The roof of the bleb is usually the upper part of the horny layer, and the base consists of the rete cells; some of the lesions are, however, deeply situated, and in these instances the roof shows a layer of rete cells and the corium is the floor. The bleb is probably due to a sudden effusion from the bloodvessels of the papillary layer, following paralysis and dilatation of these channels. The papillæ are edematous, the vessels dilated, and there is an emigration of polymorphonuclear leukocytes, with a serous infiltration of the tissues. The fluid content is neutral or alkaline in reaction, and consists of serum, pus, epithelial cells, and fat.

In pemphigus vegetans there is in addition a marked hypertrophy of the papillæ, also a proliferation and overgrowth of the rete.

Ammonia and also phosphorus have been found in the urine.

Diagnosis.—Pemphigus is to be distinguished chiefly from bullous erythema multiforme, bullous impetigo contagiosa, dermatitis herpetiformis, bullous syphiloderma, and from eczema.

Erythema multiforme rarely attacks the mucous membranes, chiefly involving the dorsum of the hands, the forearms, the lower legs, and the feet; a bullous outbreak is exceptional and other types of the affection are associated, such as macules and papules; the outbreak is usually observed in the spring and the autumn, and the disease runs a course of only a few days, to two or three weeks; constitutional involvement is slight or absent. Pemphigus tends to attack the mucous membranes, is of generalized distribution, and consists of but the one type of lesion, bullæ; seasons have no influence on the outbreak of lesions, it runs a chronic course, with more or less systemic derangement.

Bullous impetigo contagiosa runs an acute course, chiefly attacks the face, although it may be somewhat generalized, mostly attacks young infants, and other cases are frequently found in the family, household, or ward.

Dermatitis herpetiformis presents a multiforme outbreak, vesicles, bullæ, and also papules and pustules are observed in the different attacks, there is intense itching, a marked tendency to the formation of herpetic groups, the lesions develop upon an inflammatory base, the extremities and the face are most markedly involved; the mucous membranes are only exceptionally attacked, and constitutional symptoms are absent or very slight.

Bullous syphiloderm and *eczema* should be easily excluded; the former developing in early infancy the papules, macules, mucous patches, pharyngitis, bleeding, and fissuring of the lips and around the anus, marked involvement of the palms and the soles, a positive Wassermann, and signs of the affection in one or both parents, offer a very clear picture.

Bullæ rarely develops in eczema, itching is intense, mucous membrane involvement is unusual, thickened red patches are present, and there are erythema, vesicles, scales, crusts, and oozing.

Prognosis.—The prognosis in pemphigus is rather uncertain, depending upon the severity of the constitutional symptoms, the contents of the blebs, and the variety of the disease. Cases exhibiting lesions with purulent or hemorrhagic contents, or of a gangrenous type are almost always fatal. Septic cases arising from a wound are likewise grave.

In chronic pemphigus the affection ends in death in a considerable proportion of instances, usually after lasting for many months or years, continuously, or with relapses.

Pemphigus vegetans and pemphigus foliaceus almost invariably end fatally, after running a short or long course.

Treatment.—The patient should be placed under the best hygienic surroundings and any determinable cause eliminated. Arsenic is our most efficient remedy, given in ascending doses to the point

of tolerance, until the outbreak is somewhat controlled, and then continued in moderate doses over a considerable period. Strychnine and quinine in large doses have been used as supportive measures. Arsphenamine and neoarsphenamine have also been employed with temporary betterment, at least. The other preparations which have been administered internally are iron, cod-liver oil, opium, pilocarpine, and atropine. Salicin in 15 gr. (1.) doses, four times daily, may be tried.

Externally soothing applications are to be suggested and evacuation of the blebs as soon as they form. The mild lotions and dusting powders mentioned under eczema may be employed. Frequent bathing with unmedicated water, bran-water, and the continuous bath (Hebra) are suggested. Boric acid, 20 gr. (1.3) to the ounce of petrolatum (30.); phenol, 5 to 8 gr. (0.32 to 0.5), and 5 gr. (0.32) of the salicylate of soda, for its antiseptic effect, may be added. In cases of pemphigus vegetans, 1 to 4000 potassium permanganate solution may be used as a deodorant.

IMPETIGO HERPETIFORMIS.

Definition.—An extremely rare inflammatory disease almost invariably observed during pregnancy, characterized by the development of groups of pustules, preceded and accompanied by grave constitutional symptoms, and usually terminating fatally.

Symptoms.—The groins, the navel, the axillæ, the breast, the thighs, and, at times, other portions of the cutaneous surface are attacked by erythematous macules, followed by pin-head and larger sized pustules, usually arranged in groups. A brownish-colored crust results from the rupture of the lesions, and occasionally concentric rings of disease are observed and large areas become involved. The skin beneath the crusts is reddened, infiltrated, smooth, and moist, but without ulceration. Exceptionally several types of lesions may be present. The lingual mucous membrane may show grayish, well-defined patches, with a central depression. Rigors and fever may be marked at the time of a fresh outbreak of pustules.

Etiology and Pathology.—The etiology is unknown, excepting for the fact that most cases have occurred during pregnancy. Exceptionally the affection has developed in women independent of pregnancy. In a few rare instances the disease has attacked the male sex. Several microörganisms have been isolated, but none have been proved causal. The affection is evidently an infection, probably of septic origin.

The blood and the lymph vessels are dilated and there is swelling of the endothelium, and a surrounding infiltration with embryonic

cells. There is widening of the interpapillary processes of the epidermis and a round-celled infiltration of the corium.

Diagnosis.—The disease resembles most markedly dermatitis herpetiformis and pemphigus. The former is, however, rarely fatal, runs an entirely different course, shows multiform lesions, and is usually of the vesicular or vesico-bullous type. Pemphigus is characterized by bullæ of large size, rather than pustules.

Prognosis.—Most of the cases end fatally; 11 of the 13 Vienna cases succumbed; 19 of the 34 instances collected by Borgester died.

Treatment.—The various preparations suggested in the treatment of pemphigus and dermatitis herpetiformis are suggested in the present affection.

GANGRENE OF THE SKIN.

Synonyms.—Sphaceloderma; Dermatitis gangrenosa; Erythema gangrenosum; Spontaneous gangrene of the skin.

Gangrene of the skin may be divided for convenience of description under four headings: *Dermatitis gangrenosa infantum; multiple gangrene of the skin in adults; diabetic gangrene;* and *symmetric gangrene.*

Dermatitis Gangrenosa Infantum.—**Synonyms.**—Varicella gangrenosa (Hutchinson); Pemphigus gangrenosus; Multiple cachectic gangrene; Infantile gangrenous ecthyma; Multiple disseminated gangrene of the skin in infants; Rupia escharotica; Ecthyma térébrant; Ecthyma infantile gangreneux; Ecthyma gangrenosum.

Definition.—The affection is characterized by the development of gangrenous areas in children, which appear spontaneously or follow vesicular or pustular conditions, particularly varicella or vaccinia.

Symptoms.—The affection is characterized by the development of vesicles or papules which become pustular and are surrounded by an inflammatory areola. The lesions rupture and a crust forms; beneath the latter is observed ulceration which may extend peripherally beyond the lesion. A grayish or grayish-black eschar results. Some of the lesions become confluent and large, irregularly shaped, and rounded or oval ulcers are observed. Irregularly shaped, rounded or oval scars remain after the lesions heal. The covered portions of the body show the chief involvement, particularly the buttocks and the legs.

Fresh outbreaks may occur over the course of a few days, a week, or longer. The eruptions may be abundant or consist of only a few lesions. They may be large or small, and in some instances

contain blood. Hemorrhages occur in grave instances, from the stomach, the intestines, and the kidneys.

Systemic symptoms may be absent, mild or severe, such as high fever, vomiting, diarrhea, cardiac and pulmonary complications, and septicemia.

Etiology and Pathology.—The disease is of rare occurrence and is usually observed in debilitated and anemic children and infants, particularly in females. It has been observed most frequently following varicella, and at times vaccinia. In certain instances it has developed spontaneously. Tuberculosis and syphilis have both been suggested as casual. The affection is probably caused by some microörganism which has not, as yet, been determined; short rods resembling bacilli have been found in a few instances, also the Bacillus pyocyaneus and the diphtheria bacillus.

FIG. 48.—Varicella gangrenosa. Fatal termination in four days.

Diagnosis and Prognosis.—The resulting gangrenous areas with the preceding papulo-pustular or vesiculo-pustular lesions could hardly be mistaken for any other affection.

Death not infrequently results, although a considerable number of cases recover. An abundant outbreak, particularly of large lesions, and more especially of hemorrhagic contents, offers an unfavorable prognosis.

Treatment.—Treatment is chiefly symptomatic and supportive. Sodium salicylate and quinine are usually employed, but frequently without much avail. Locally, antiseptic preparations are used, such as a saturated solution of boric acid, or the official ointment of boric acid.

Multiple Gangrene of the Skin in Adults.—Definition.—An affection characterized by the development of a few or many areas of gangrene of spontaneous or determinable causation, frequently closely allied to the form found in childhood.

Symptoms.—The attack develops with the appearance of erythematous spots, wheal-like lesions, or vesicles, which subsequently become gangrenous. The outbreak may continue to appear for a few days, a week or more, and exceptionally over a considerable period. Practically any portion of the integument shows involvement. The outbreak usually is discrete but confluence may occur, and also peripheral growth of the lesions. In most cases but a few lesions are present. Constitutional symptoms are frequently absent or very mild.

Fig. 49.—Gangrene of the skin in a diabetic patient.

Etiology and Pathology.—Multiple gangrene is commonly seen in the female sex. It follows various accidents, particularly burns. Systemic diseases, such as typhoid fever, scarlet fever, measles, malaria, etc., have preceded an outbreak. Certain drugs, such as the bromides and the iodides, have been mentioned as causative. A bacillus has been found in several instances, and Vincent's bacillus in a few. A lowered cutaneous resistance due to neuroses or trophoneuroses and a bacterial infection are the cause of the affection.

Prognosis and Treatment.—Recovery usually results, although the course of the affection may be somewhat prolonged.

The treatment of the affection is symptomatic, depending upon any determinable underlying cause. Arsenic, iron, cod-liver oil,

and tonic treatment have been employed. Locally, surgical interference is at times required, otherwise mild antiseptic dressing such as boric acid ointment is used.

Diabetic Gangrene.—Definition.—An affection characterized by the development of gangrenous areas on the skin in those with diabetes.

Symptoms.—The outbreak develops spontaneously without previous injury to the cutaneous surface, or occurs at the site of a slight trauma or on a skin eruption. The integument becomes rapidly gangrenous, usually of the moist form, and spreads to the deeper tissues, or inflammation with vesicles and bullæ may first be observed and later areas of gangrene.

There may be a preceding loss of sensation or neuralgic pains, coldness, and intermittent flushing and lividity of the affected part. One or more areas may be attacked. Occasionally it is of symmetrical involvement. The patches are rounded, irregular, or serpiginous in outline. The hands, the fingers, the feet, and the toes are most frequently attacked, and at times the genital region or other portions of the integument.

Etiology and Pathology.—Gangrene is a rare complication of diabetes. The condition is usually observed in older individuals, and frequently in those with atheromatous changes in the arteries, more particularly in the male sex. Glycosuria causes the skin to have a lessened resistance to microbic invasion, following even the slightest traumatism. Therefore impregnation of the tissues with sugar, trauma, arterial change, and bacterial invasion are the underlying causes of the affection.

Prognosis and Treatment.—The prognosis is rather unfavorable, as gangrene of the skin is a grave complication of diabetes mellitus. The gangrenous areas are apt to extend and new areas to develop, and septic poisoning may cause death. Cases of spontaneous origin may recover.

The first indication is the treatment of the underlying diabetes and the constitutional betterment of the patient. Surgical treatment is usually indicated and the local application of mild antiseptic ointments.

Symmetric Gangrene.—Synonyms.—Local asphyxia; Raynaud's disease.

Definition.—A symmetrical asphyxia of the extremities, usually terminating in gangrene of the skin and the underlying tissues. Raynaud gave the first complete description of the affection, which is of rather rare occurrence.

Symptoms.—Prodromal symptoms of intermittent abnormal sensations consisting of paresthesia in different portions of the body, headache and general malaise, chiefly observed during the

winter months, may be observed. A profound disturbance of vascular innervation is noted. The phalanges become symmetrically pale, bloodless, and painful. The affection may then proceed to the stage of asphyxia, the attacked area becomes of a dark red, livid hue, swollen and tender, and later of a bluish to bluish-black, or black and gangrenous. Gangrene is usually of the dry form. The condition may remain without the development of gangrene for a considerable period or indefinitely, but eventually, in most cases, death of the skin and the underlying tissues results. The condition is occasionally better during the summer months. The extremities, particularly the hands and fingers, are symmetrically attacked. The ears, the nose, and other portions of the integument may show the anomaly, but in these areas gangrene usually does not result. If gangrene does not result the affected parts become atrophic and indurated, and ulcers may be observed. There is frequently a considerable amount of burning and pain of the affected areas.

Etiology and Pathology.—The condition apparently is due to trophic disturbances associated with the nervous system. It is probably due to some underlying condition rather than a separate disease. The affection has been ascribed to cold, exposure, nutritional disturbances, following or associated with severe constitutional disorders and neuroses. Raynaud's disease has been observed in connection with diphtheria, scarlatina, typhoid fever, measles, diabetes, malaria, hemoglobinuria, cardiovascular conditions, Bright's disease, exophthalmic goiter, hysterical affections, syphilis, tuberculosis, generalized scleroderma, and associated with eczema, hyperidrosis, purpura, and urticaria. The sufferers frequently have cold hands and feet. Beck has demonstrated in two cases atrophic and other changes in the bones. Both sexes and all ages have been attacked.

Diagnosis and Prognosis.—The disease could scarcely be mistaken for any other if the symmetrical character, the sites of attack, and the course are considered.

Recovery rarely occurs, although betterment is observed in certain instances, particularly during the warm weather.

Treatment.—If any underlying factor can be determined it should be eliminated as far as it is possible. Remedies having an effect upon the peripheral circulation, such as amyl nitrite and nitroglycerin, have been employed. Potassium iodide has been administered. Both galvanic and faradic electricity have been used. The positive pole of the former current is applied to the fifth cervical vertebra and the negative over the lumbar or sacral region, daily, for from five to ten minutes, and, using a fairly strong current. The negative pole is also applied at times to the affected

area. Stimulation is used in the early stage, cold applications, frictions, and massage, and later antiseptic preparations and surgical means.

DERMATITIS CALORICA.

Definition.—An inflammation of the skin, of varying intensity, caused by heat or cold. The condition may be so slight that simply redness of the cutaneous surface is observed (*erythema caloricum*) and should then be classed under erythema, or sufficiently severe as to cause destruction of the tissues. The condition is classed under two headings: The form due to excessive heat or burns (*dermatitis ambustionis*), and due to excessive cold or freezing (*dermatitis congelationis; frost-bites*).

FIG. 50.—Dermatitis calorica, with ulceration.

Dermatitis Ambustionis.—Symptoms.—Burns may vary from the slight redness observed following exposure to the actinic rays of the sun (*erythema solare, dermatitis actinica*), to destruction of the tissues by fire, boiling water, acids, etc. Burns are usually divided into three degrees, depending upon their severity: The first consists of simple redness, with the sensation of heat of the affected areas, and at times slight swelling (*dermatitis ambustionis erythematosa*). The second is characterized by the additional phenomena of vesicles and bullous formation, and a considerable amount of swelling (*dermatitis ambustionis bullosa*). The third degree is observed to have in addition to the symptoms mentioned the formation of variously sized eschars, of a superficial or deep character.

In severe instances and also those of a milder type there may be marked constitutional symptoms, particularly shock; grave derange-

ments of the internal organs may result, or suppuration may cause a severe drain on the system.

Prognosis and Treatment.—Burns of the first or second degree are rarely fatal, excepting in instances of extensive involvement; those involving large areas or of the third degree may terminate fatally. Death has been attributed in these cases to shock, changes in red-blood cells, toxins or ptomains.

In burns of the first degree the mild dusting powders or lotions mentioned under erythema are of use. In severe instances of the second or third degree supportive measures and narcotics are required. Locally in severe burns lotions or ointments are soothing and helpful. Saturated solution of boric acid, applied frequently and freely, keeping the surface continuously moist, is efficacious. The official ointment of boric acid may be applied two or three times daily; or a 1 per cent solution of picric acid; olive or sweet oil, or equal parts of either, combined with lime-water containing 20 gr. (1.3) of boric acid to the ounce (30.). When the acuteness of the burn is subsiding somewhat the following prescription is beneficial: Boric acid, 20 gr. (1.3); powdered zinc oxide, 1 to 2 dr. (4. to 8.); petrolatum, 6 to 7 dr. (24. to 28.). Phenol in the strength of 5 minims (0.32) to the ounce (30.) of the former ointment is soothing in these cases, if the burned surface is small. In extensive cases accompanied by severe shock a continuous warm bath is indicated.

Dermatitis Congelationis.—**Symptoms.**—Dermatitis resulting from various grades of cold may be divided into three degrees of severity. In the first the affected area is hyperemic, and occasionally of dark or dusky appearance; the congestion may persist or be observed only upon exposure to cold or mild degrees of heat. The condition may run a somewhat persistent course, particularly during the cold weather, and is accompanied by burning and itching (*chilblains*). The second degree is characterized by bright red or livid skin, vesicle and bullous formation, and occasionally serous undermining of the epidermis. In the third degree the part is pallid and stiff, the part then becomes reddened, vesicles and bullæ may be present, and superficial ulceration, and eventually the skin returns to normal, with the possible exception of slight scarring, or the involved portion becomes gangrenous. In severe instances of extensive involvement constitutional symptoms may be marked; shock is profound and suppuration and septicemia result.

Prognosis and Treatment.—The prognosis is always favorable excepting in extensive cases or in those of the third degree.

The treatment in severe instances has to be supportive. Local applications are the same as are suggested under erythema. Imme-

diately after exposure to the cold the part should be rubbed with snow or cold water compresses are applied. The temperature of the applications is raised until the normal condition is reached. The vesicles and bullæ should be carefully opened and mild applications applied, such as salicylic acid, 5 gr. (0.32); phenol, 5 gr. (0.32) to the ounce (30.) of zinc oxide ointment, or boric acid ointment. Ichthyol lotion or ointment is useful; ichthyol, ½ to 1 dr. (2. to 4.); powdered zinc oxide, ½ dr. (2.); lime-water, 1 fl. oz. (30.); ichthyol, ½ dr. (2.); powdered bismuth subcarbonate, 2 dr. (8.); petrolatum, 6 dr. (24.). The lotions mentioned under dermatitis ambustionis are also of use. Patients who are subject to frost-bite should wear woollen stockings during the cold weather as a preventive measure. Severe instances have to be treated surgically.

DERMATITIS TRAUMATICA.

The variety, the severity, the repetition, and the length of action of the trauma determine the grade and the extent of the inflammatory symptoms. Friction, contusions, surgical operations, animal parasites, continued scratching, tight-fitting garments, bandages, constant pressure (bed-sores), and the various implements of trade are exciting causes.

Treatment.—Treatment consists in the elimination of the cause and the application of soothing applications, such as boric acid, 20 gr. (1.3); powered bismuth subcarbonate, 2 dr. (8.); petrolatum, 6 dr. (24.). In the treatment of bed-sores the addition of ichthyol, ½ dr. (2.) to the ounce (30.) of the last, is beneficial.

DERMATITIS VENENATA.

Definition.—An inflammation of the skin of varying intensity caused by caustic, irritant, and toxic agents.

Symptoms.—The eruption usually consists of erythematous reddened patches, swelling, closely packed pin-head-sized papules, vesicles, pustules, bullæ, and exceptionally wheals, scales, crusts, serous and purulent discharges, subcutaneous abscesses, and even gangrene. Any or all of these lesions may be present, and the outbreak may be limited or of extensive distribution. The eruption may extend beyond the surface upon which the irritant has acted, or as the result of absorption, toxic effect, reflex nervous irritation, may appear on distant portions of the body. Naturally the portion of the cutaneous surface most exposed to the irritation chiefly exhibits the outbreak; therefore the forearms, the hands and the face are frequently the sites of attack, although no portion of the integument is immune. Burning and itching are frequently

present. The affection in a great many instances lasts but a few days, a week, or longer.

Numerous drugs are capable of producing a dermatitis, particularly those employed by surgeons, nurses, attendants, etc., chiefly formalin, bichloride of mercury, carbolic acid, and strong soaps.

FIG. 51.—Dermatitis venenata. (Fox.)

FIG. 52.—Dermatitis venenata resulting from the application of an irritant.

Plant poisoning usually attacks the hands, the forearms, the face, and the genitalia, and is characterized by erythematous areas and closely grouped pin-head- to pin-point-sized vesicles, bullæ, and is frequently accompanied by marked swelling.

Etiology.—Any irritant if in contact with the skin for a sufficient period or acting frequently may cause a dermatitis. Slight irritation of transient duration may produce an inflammation in the integument if the individual has a certain idiosyncrasy to the application. The various caustic, irritant, and toxic agents which produce a dermatitis can be divided into those of plant origin; caused by irritants, independent of occupation; trade origin; local application of drugs; and from insects, fish, etc. The most of these have been mentioned under the external etiology of eczema, and therefore only a few need be enumerated here, as the reader is referred to that disease.

There are some sixty or seventy plants which cause irritation of the skin in those who are susceptible, the most important of which are the poison ivy and primrose, because the outbreak from these two is most frequently seen. The outbreak of *poison ivy* usually attacks the hands, the forearms, the face, and the genitalia, and is characterized by erythematous areas and closely grouped pin-point- to small pin-head-sized vesicles, bullæ, and swelling. Crusts may also form because of the rupture of the lesions. Toxicodendric acid, which is the active principle of the poison ivy (rhus toxicodendron), is evidently conveyed by scratching from one part to another and thus causes fresh lesions. *Primrose* (primula obconica) *dermatitis* is of rather frequent occurrence and is characterized by a severe itching, papular, erythematous and vesicular eruption of an eczematous type, or a bullous outbreak, or urticaria-like lesions may be present.

A large number of irritants depending upon trade or independent of occupation have been mentioned under the external causes of eczema and will not be repeated.

Although various drugs causing a dermatitis or an eczema have been mentioned under the latter disease, a few will be enlarged upon under the present headings.

Alcohol.—The various medicaments used in alcohol may give rise to a marked dermatitis of an erythemato-squamous or vesicular type, observed on the areas of application, usually the hands and forearms. An outbreak may subsequently develop on other portions of the skin surface.

Arnica, which is frequently applied as a home remedy for numerous simple wounds, at times produces a severe dermatitis, occasionally accompanied by constitutional symptoms.

Chrysarobin when applied locally produces a peculiar coppery red erythema which may extend a considerable distance beyond the site of application. The dermatitis occasionally produced by its application to the scalp may extend to the forehead and the eyes, causing an erysipelas-like outbreak and severe conjunctivitis.

Croton oil and *tartar emetic,* which were formerly employed as counter-irritants, at times produce a pustular outbreak followed by scarring.

Iodine, particularly if old and if in an unusually concentrated solution, may produce a marked vesicular outbreak with redness and considerable swelling. Occasionally a physician prescribes or a patient uses an ammoniated mercury ointment very shortly after applying iodine, with the result that a marked dermatitis develops which may be associated with considerable swelling, and a tendency to spread. The outbreak from the formation of the iodide of mercury may cause enlargement of the nearest lymphatic glands and constitutional symptoms of a rather severe type.

Iodoform, more particularly in the powdered form, frequently causes a dermatitis of an erythematous, at times vesicular or bullous type, limited to the seat of application or extending over a considerable portion of the cutaneous surface.

Mercury if vigorously applied to a sensitive skin or employed over a considerable period, in the form of the official ointment, may cause a violent dermatitis of a localized or somewhat general distribution.

Various components of the *explosive material* found in bombs caused many cases of *dermatitis* during the war. These cases presented vesicles and bullæ and were accompanied by yellow staining of the skin. The outbreak usually appeared about nine days after exposure to the irritant.

Match-box Dermatitis.—An artificial dermatitis induced by Swedish matches was described in 1918 by Rasch and others in Denmark. Similar cases were later reported in this country by G. H. Fox and C. J. White. The outbreak occurs on the thigh under the pocket where a box of matches was carried. A well-defined red scaly patch is observed; inflammatory areas may later develop on the face, eyelids, hands and other portions of the cutaneous surfaces. Recurrences are common until the special variety of match found to be causal is discarded.

Diagnosis.—It may be rather difficult to differentiate dermatitis from eczema in certain instances. The acuteness of onset, the violent character of the outbreak, the distribution of the attack, and the determinable causation differentiate the former from the latter. In rhus poisoning the outbreak frequently begins between the fingers, is markedly acute, and is characterized by numerous closely packed miliary vesicles and bullous lesions; bullæ are of rare occurrence in eczema.

Prognosis and Treatment.—The affection usually runs a short course and recovery rapidly takes place after the elimination of the cause.

The mild applications suggested in eczema are efficacious. The two preparations which have proved particularly beneficial are: Boric acid, 1 dr. (4.); powdered bismuth subgallate, 2 dr. (8.); glycerin, ½ dr. (2.); camphor-water, 4 fl. oz. (120.); boric acid, 1 dr. (4.); powdered zinc oxide, 2 dr. (8.); glycerin, 40 minims (2.6); witch-hazel, 4 fl. oz. (120.). An ointment containing menthol, 2 gr. (0.12); powdered bismuth subcarbonate, 2 dr. (8.); petrolatum, 6 dr. (24.), is of use in cases with slight or an absence of moisture. Soap and water frequently are irritating to the inflamed areas and the surface should then be cleansed with a saturated solution of boric acid, olive oil, or petrolatum.

As regards the possibility of immunizing patients against poison ivy, Schamberg announces that this can be done. The method of treatment which he advocates is as follows:

℞—Tet. rhus toxicodendron	♏xv	1
Rectified spirit	♏lxxv	5
Syr. aurantii	q. s.	iv	100

M.

The patient is instructed to take the mixture in half of a glass of water after meals as follows:

Breakfast, drops.	Lunch, drops.	Dinner, drops.
1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	21

When this dosage has been reached the patient is to take 1 teaspoonful once a day, and this should be continued throughout the ivy season. The immunity thus created is supposed to last one month.

DERMATITIS MEDICAMENTOSA.

Synonym.—Drug eruptions.

Definition.—An inflammatory outbreak of generalized or localized distribution, and of varying type, caused by the ingestion or absorption of drugs.

Symptoms.—The external manifestations of drug absorption may be of any type, and general in distribution or with localized lesions, depending upon the quantity of the preparation that has been administered, the length of time the remedy has been ingested, and any idiosyncrasy of the patient or derangement particularly of the eliminative organs or the cardiovascular system. The out-

break may occur after one or only a few small or medium-sized doses in some individuals; the preparations are given over a considerable period in others, or the drug may be more or less cumulative, as with the bromides, and at times the iodides. Almost any drug may produce an outbreak in a predisposed individual.

The drugs more or less in common use give rise to the outbreaks recorded below:

Acetanilide.—Erythematous, of a macular and maculo-papular type, and at times cyanosis of the face, the lips, and extremities.

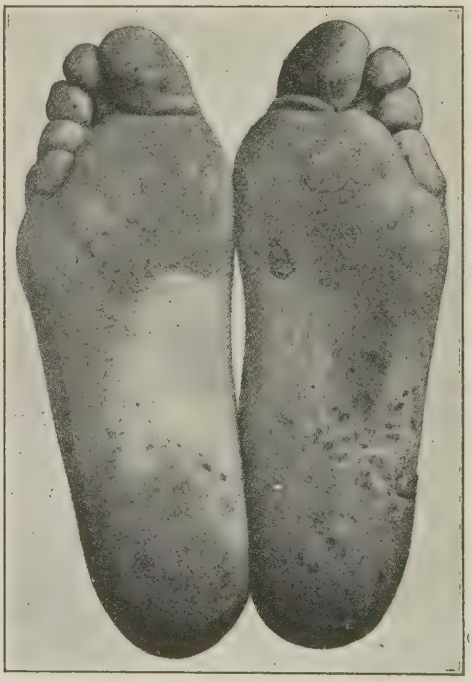


Fig. 53.—Keratosis punctata in a man who had been taking arsenic for a long-standing psoriasis. (Ormsby.)

Acetylsalicylic acid may cause an urticarial or scarlatiniform outbreak, with swelling of the face, the nasal, buccal and pharyngeal mucous membranes, and intense general malaise.

Aconite.—Rarely occurs; if present, is of a vesicular, bullous, or pustular type.

Adalin may produce an urticarial eruption associated with intense itching; a papular, eczematoid, erythematous plaque, petechiæ, and later pigmentation may be observed.

Alcohol.—In rare instances an erythematous or urticarial outbreak develops.

Antimony and Tartar Emetic.—Exceptionally an urticarial and vesico-pustular.

Antipyrin.—Macular and papular, urticarial, and occasionally vesicular, bullous, and purpuric.

Antitoxin Eruptions.—(See Serum Eruptions.)

FIG. 54.—Arsenical pigmentation.

Arsenic.—Almost every form of cutaneous outbreak has followed the ingestion of this drug; erythematous, papular, vesicular, urticarial, pustular, bullous, petechial, erysipelatous, herpetic, furuncular, carbuncular, ulcerative and gangrenous. The long-continued use of the remedy may cause extensive pigmentation. The drug used over a long period may give rise to horny, wart-like growths upon the palms and the soles, which in some instances have undergone malignant change and resulted in death.

Arsphenamine (Salvarsan).—Arsphenamine and neoarsphenamine may cause several different types of eruption; those most frequently observed are of the urticarial and erythematous types.

The other varieties of outbreak which have been observed are morbilliform erythema, vesicular and bullous lesions, and rarely gangrenous. A generalized exfoliative dermatitis may develop, which sometimes persists for several weeks or months, and in rare instances has terminated fatally.

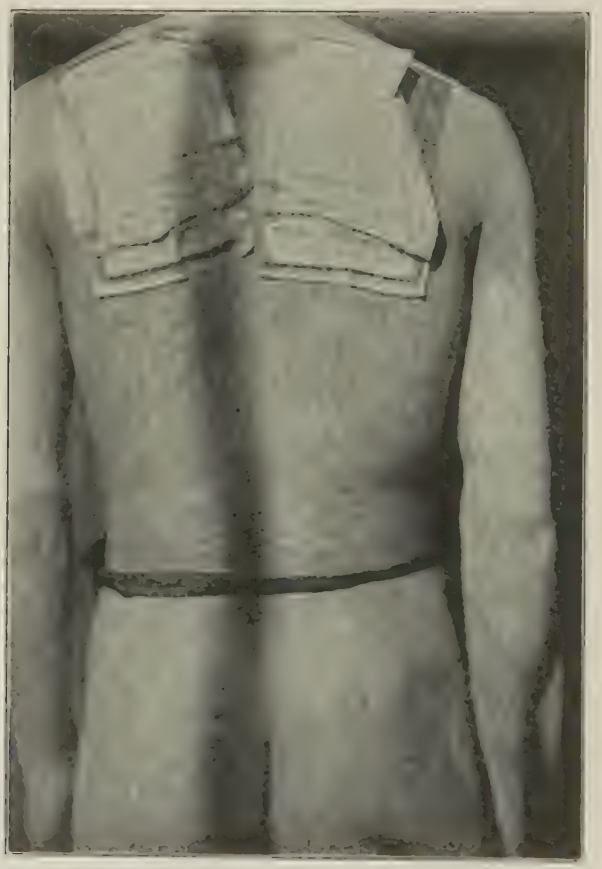


Fig. 55.—Belladonna eruption. Purpuric lesions from absorption of belladonna plasters.

Aspirin.—An urticarial outbreak, rarely ending fatally, from edema of the glottis.

Atophan has caused a scarlatiniform erythema and other erythematous eruptions.

Barbital.—An eruption may develop of a morbilliform type, red plaques, rarely blebs, with mucous membrane lesions and fever. So-called "fixed outbreaks" may occur.

Belladonna and Atropine.—The usual outbreak resembles scarlatina. Patchy erythematous areas and exceptionally erythema and gangrene of the scrotum have been observed. Absorption from a belladonna plaster, in a case of the writer, caused a generalized purpuric outbreak.

Benzoic Acid and Sodium Benzoate.—Exanthems from these preparations are unusual; in the former the outbreak is of an erythematous, erythemato-papular or urticarial type; from the latter drug, erythematous, polymorphous, and urticarial.

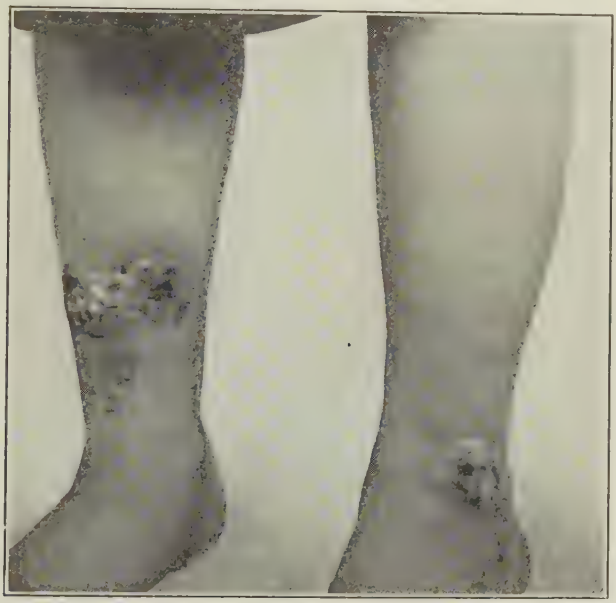


FIG. 56.—Bromide eruption. Girl, aged thirteen years, who had taken large doses of the drug over a considerable period.

Boric Acid and Sodium Borate. Exceptionally an outbreak occurs from the former, of an erythematous, papular, or bullous type, at times an erythemato-squamous outbreak, with partial or complete loss of the scalp hair. The latter may produce an erythematous, morbilliform, eczematous, psoriasis-like outbreak.

Bromin Compounds (Bromides). Medicinal outbreaks from this drug are of frequent occurrence and develop after a few grains have been administered, after long administration, and, at times, a week or more after the preparation has been stopped. The eruption may continue to appear for several weeks after the drug has been discontinued. The most frequent type of lesion in the adult is the acne-like. Most cases consist of a multiforme eruption with

a predominance of one type. The following varieties have been observed: Varicella-like, ecthymatous, a type resembling erythema nodosum, raspberry-like, bullous or pemphigus-like, squamous, papillomatous, the arthracoid, carbuncular, tubercular and tuberculous, condyloma-like, the confluent acne or pustular, the umbilicated or the molluscum contagiosa type, the fungating and mycosis fungoides type, and the ulcerative.

In childhood the outbreak is most apt to attack the extremities and the face, particularly the lower legs. The lesions are usually more severe in childhood than in adults. The contents of the lesions in a considerable number of instances are cheesy or curdled-milk in appearance. There are usually no constitutional symptoms. An outbreak may occur in a nursing infant by transmission of the drug through the mother's milk. Any of the bromides or bromin compounds may be causal of an eruption.

FIG. 57.—Bromide eruption. The outbreak caused by taking a "soothing syrup" containing bromide.

Bromural may cause a pustular or tuberose outbreak.

Calx Sulphurata.—Furuncular and pustular types are observed, and exceptionally a vesicular or petechial outbreak.

Cannabis Indica.—This drug exceptionally causes an outbreak which may be of the vesicular type and accompanied by itching.

Cantharides.—An outbreak rarely occurs following the ingestion of this drug, if so it is of the erythematous or papular varieties.

Capsicum.—The erythematous and papulo-vesicular types characterize the rare outbreaks from this drug.

Castor oil rarely occasions an attack of an erythematous type accompanied by itching.

Chinolin.—An exanthem of an erythematous character is not infrequently observed.

Chloral.—The usual type of outbreak from this drug is scarlatina-like and may be accompanied by fever, congestion of the buccal and conjunctival mucous membranes, and is followed by desquamation. Several other varieties of lesions may be observed, such as wheals, papules, vesicles, bullæ, furuncles, carbuncles, hemorrhages, and ulcerations of the skin, the tongue, and the cornea.

Chloramide.—Exceptionally an outbreak occurs of an erythematous and vesicular type, with congestion of the mucous membranes of the nose and the mouth, coryza, fever, and subsequent desquamation.

Chloroform.—Not infrequently an erythematous outbreak develops in the form of small macules, and at times a purpuric outbreak is exhibited.

Cinchophen may produce an erysipelatous eruption with chills, or a scarlatiniform, urticarial or mixed rashes.

Codeine has caused a widespread erythema.

Codeonal.—Reddish-blue, pruritic plaques, associated with fever may develop on the face and chest.

Cod-liver oil in rare instances gives rise to vesicular or acneiform eruptions.

Condurango exceptionally causes an acne-like or furuncular attack.

Conium in a few instances has caused erythematous, papular, and erysipelas-like lesions.

Copaiba and *cubebs* not infrequently produce an outbreak, the former or the combination of the two causing a scarlatiniform, urticarial, erythematous, and exceptionally vesicular, petechial, and bullous lesions. An outbreak from the latter, uncombined with the former, is of unusual occurrence, and is of the erythematous and small papular variety. There may be considerable itching.

Digitalis exceptionally produces a scarlatiniform, papular, erythemato-papular, urticarial, or an outbreak on the face resembling erysipelas.

Dulcamara rarely causes an outbreak; in the event of occurrence it is apt to be erythematous, urticarial, or erythemato-squamous.

Ergot eruptions usually develop from eating ergoted rye in bread, over long periods, and is followed by redness and swelling of the face and arm, also petechiæ, vesicles, pustules, furuncles, and circumscribed gangrene. In an endemic outbreak bullæ, miliaria, eczema, boils, urticaria, and loss of the scalp hair and nails has been noted.

Eucalyptus may produce an outbreak of papules and nodules of a bright red, cherry-red, and brownish-red color, which may be circumscribed, or with a confluent tendency on the hands and feet, accompanied by moderate itching and preceded by mild general symptoms.

Fibrolysin injections occasionally cause a generalized erythema.

Guaiacum exceptionally produces an outbreak of minute erythematous spots.

Guarana causes in rare instances an outbreak of an urticarial type.

Gurjun oil rarely causes an exanthem of the erythematous and erythemato-papular varieties.

Hexamethylenamine may produce an urticarial outbreak, associated with intense itching, swelling of the eyelids, conjunctivitis, headache and tinnitus.

Hyoscyamus occasionally initiates an eruption of the erythematous and urticarial varieties, accompanied by edema, and exceptionally with scarlatina-like, pustular, and purpuric lesions.

Iodine and its Compounds.—Iodine and its various combinations, particularly the salts, is the cause of numerous eruptions. The face, shoulders, and back are most apt to be attacked, but the lesions may be more or less generally distributed. A few moderate doses may suffice to induce an attack, but usually the drug is administered either over a considerable period or in large doses before an outbreak is incited. The usual and mildest form of lesion is the papulo-pustular or acne-like. Other lesions which have been observed are the papillomatous, condyloma-like, carbuncular, crustaceous or rupial-like and exceptionally a multiforme outbreak resembling erythema multiforme, erythema nodosum, or urticaria. A bullous type may be noted which is apt to be accompanied by considerable redness and swelling, and with marked constitutional symptoms. Purpuric and bullous outbreaks with hemorrhagic contents may be observed which chiefly attack the extremities, particularly the lower. In these severe instances the mucous membranes may show involvement, and there may be hemorrhage from the lungs, the intestines, from the stomach, the gums, and in the brain.

The eruptive tendency may persist for some time after the drug has been discontinued, and rarely does not appear until the cessation of the medication. Outbreaks have occurred in nursing infants, the drug acting through the mother's milk. The potassium salt is more apt to cause an attack, although the other salts have been causative. The administration of the iodides in large doses to those individuals who have a strong idiosyncrasy to the drug, or in cases of organic disease of the heart or kidneys, is frequently a dangerous procedure. A considerable proportion of the bullous and hemorrhagic cases have ended fatally.

Iodoform exceptionally produces an outbreak by absorption, and may be erythematous, erythemato-papular, polymorphous, vesicular, bullous, and petechial.

Ipecac in a few instances has been productive of circumscribed erysipelatous patches locally or generally distributed.

Iron rarely has produced acne-like pustules on the face, neck, and upper part of the trunk.

Jaborandi and *pilocarpine* rarely have caused an erythematous, small papular and urticarial attack, accompanied by active diaphoresis.

Lead in the form of the carbonate or acetate is in rare instances causal of erythema and purpura.

Medinal.—(See Barbital.)

Melubrin may cause a localized or generalized papular outbreak, of the same type which occasionally occurs after the ingestion of antipyrin.

Mercury not infrequently has caused in large doses, particularly in the past, erythematous, scarlatiniform, papular, pustular, herpetic, bullous, purpuric, furuncular, and ulcerative lesions.

Midal, which contains pyramidon, may induce an erythema, wheals and purpuric lesions on the legs, associated with itching.

Opium and *morphine* at times are productive of an erythema of a scarlatina-like type, also morbilliform, polymorphous, accompanied by intense itching and followed by desquamation. Urticarial, vesicular, bullous, pustular, furuncular, and carbuncular varieties.

Phenacetin in a few instances has caused an attack of an erythematous, erythemato-papular, or urticarial variety.

Phenobarbital is occasionally causal of a rash resembling measles or scarlet fever, with a marked swelling of the face. Blisters and swelling of the mouth and tongue may be observed.

Phenolphthalein occasionally produces erythematous plaques followed by pigmentation. An urticarial outbreak has also been observed.

Phosphoric acid and *phosphorus* rarely produce bullæ and purpura.

Pimpinella exceptionally is productive of an urticaria-like rash.

Piper methysticum, kava kava, the fermented juice derived from this plant, may cause an erythemato-squamous dermatitis with exfoliation.

Potassium chlorate exceptionally may cause an attack of erythemato-papular, polymorphous, and cyanotic lesions.

Quinine and *cinchona* occasionally are causal of an outbreak of an erythema type resembling scarlatina, which may be followed by desquamation, and other varieties such as urticaria, purpura, vesicles, bullæ, erysipelas-like, and gangrenous. There may be rather marked constitutional symptoms. The fraction of a grain or a few grains may cause an attack in those who are predisposed to the action of the drug. There may be intense itching. It may

resemble scarlatina markedly but the history of susceptibility to the drug, the lack of pharyngitis, and the typical tongue easily differentiate the conditions.

Rhubarb exceptionally is causative of an erythema of the desquamative scarlatinal type.

Salicin infrequently causes erythematous outbreaks.

Salicylic acid, or the salicylates, not uncommonly produces erythematous, scarlatiniform and urticarial lesions, which may be followed by desquamation. Vesicles, bullæ, purpura, and even gangrene may rarely be observed.

FIG. 58.—Dermatitis from packing quinine.

Salipyrin has been the attributed cause of edema and destruction of tissues.

Salol has exceptionally been causal of an urticaria-like eruption.

Santal oil in rare instances causes purpura.

Santonin, or sodium santonate, in exceptional instances has been productive of generalized urticaria-like lesions, with desquamation and edema. The latter has caused vesicular lesions.

Serum Eruptions.—The injection of serum into an individual is frequently followed by toxic symptoms, including an eruption. The outbreak is apparently due to certain albuminous bodies in

the serum and not to the antitoxin itself. Eruptions have been observed after the use of antidiphtheric, antistreptococcic, antitetanic, and other sera. The frequency of the occurrences of rashes following the use of antitoxin varies between 8.1 per cent and 33.1 per cent, depending upon the variety and strength of the serum employed. The rash appears on the average from six to eight days after the administration of the antitoxin: in some instances, however, it has been observed on the day following the injection and in others after a month had elapsed.

In the great majority of cases the outbreak has been of an urticarial character, next in point of frequency it is of an erythematous type. The outbreak may consist of irregular, marginated, and non-elevated patches of redness, or there is a distinct tendency to ring or gyrate formation. The rash may be scarlatina-like, measles-like, and rarely vesicular, bullous, or purpuric. Mixed outbreaks consisting of wheals, patches of erythema, and occasionally papules and vesicles are not infrequently observed.

The outbreak is extremely irregular. The distribution may be generalized, but in most instances the arms, legs, and buttocks are attacked. There are at times only a few scattered patches present, or the entire cutaneous surface is profusely covered. The outbreak usually lasts for forty-eight hours, occasionally for several days. The rash following diphtheria antitoxin may recur a few days or several weeks after its original disappearance.

The outbreak may be accompanied by a mild degree of fever, lasting for one to three days, occasionally longer. There may also be headache, some prostration, pains in the joints and articular swelling. The latter lasting for a few days.

Silver nitrate has produced a slate-color or grayish-black pigmentation or discoloration of the integument after prolonged use (argyria), and exceptionally an erythemato-papular eruption.

Sodium benzoate causes rarely erythematous patches and papules.

Stramonium not uncommonly is causal of erythema, scarlatiniform, and rarely erysipelas-like and purpuric outbreaks.

Strychnine and *nux vomica* rarely produce a scarlatiniform and miliaria-like outbreak, accompanied by itching.

Sulphonal is productive occasionally of an erythema resembling scarlatina, with an accompanying desquamation and pruritus, and rarely purpuric and morbilliform lesions.

Tanacetum produces an outbreak resembling somewhat variola.

Tannin in rare instances causes erythema and urticaria.

Tar is causative of erythematous, morbilliform, and urticarial lesions.

Thallium acetate has been credited with the production of more or less complete alopecia.

Tuberculin not infrequently has produced outbreaks of scarlatina-like and morbilliform lesions, which have occasionally been followed by desquamation; exceptionally also a psoriasis-like outbreak has been noted.

Turpentine and *terebene* have occasionally caused erythematous, scarlatiniform, morbilliform, and exceptionally vesicular, urticarial, and pustular lesions. The latter usually causes a papular outbreak accompanied by itching.

Valerian exceptionally produces an urticaria.

Veratrum viride in rare instances causes erythema and pustules.

Veronal produces occasionally localized or generalized eruptions. Erythema, maculo-papules, vesicles, scarlatina-like lesions, resembling insect bites. Brownish stains and petechial spots may remain for a time. There may be mild constitutional symptoms.

Viburnum prunifolium exceptionally incites a scarlatina-like outbreak with subsequent desquamation.

Other drugs which have caused an outbreak in exceptional cases are anacordium, bitter almonds, benzol, bitter-sweet, duboisin, creosote, resin, matico, mesotan, sulphur, and cocaine.

Those interested in the subject of drug eruptions should read the instructive articles by Wile, Wright and Smith[1] and by Wise and Parkhurst.[2]

Etiology.—Women and children are more susceptible to an outbreak. A weakened condition of the individual, particularly cardio-renal disease, defective elimination, and a nervous temperament predispose to an eruption. Several theories have been promulgated: That the skin is irritated by the drug being eliminated through the cutaneous tissues and the glands; increased skin elimination due to a defective condition of the gastro-intestinal tract and the kidneys; the presence of the drug generates some toxin or irritant in the blood which causes the cutaneous outbreak; and the drug acting upon the vasomotor centers or peripheral nerves. Engman and Mook found iodine or bromine in lesions caused by these preparations, the drugs circulating in the body tissues, and the outbreak was probably caused by the formation of a toxin acting at the points of present or former disturbances, such as on comedones, acne, and seborrheic lesions, scars, traumata, scratches, etc. In a large proportion of instances, however, no determinable reason for a drug rash could be ascertained, and the unsatisfactory deduction has to be made that the outbreak is caused by a certain susceptibility or idiosyncrasy. There is found in a great many of these eruptions enlargement of the bloodvessels, exudation of serum, outwandering blood-cells, and in the hemorrhagic cases changes in the vascular walls.

[1] Archives of Dermatology and Syphilology, November, 1922, p. 529.
[2] Ibid., p. 542.

Diagnosis.—The points of help in diagnosing drug eruptions are the acute onset, the history of taking certain remedies, the atypical course of the outbreak, their resemblance to other diseases without the exact characteristics of any one, and the absence, in most instances, of constitutional involvement.

Prognosis.—A very large proportion of medicinal eruptions disappear promptly after the drug is withdrawn, or, as with bromides and iodides, the lesions disappear slowly. The prognosis of the bullous and hemorrhagic types of outbreak should be guarded, as they are apt to be observed in individuals with cardiac and kidney disease, and may terminate in death.

Treatment.—The withdrawal of the drug in most instances causes an involution of the lesions, either slowly or rapidly, without any medication being employed. Free elimination is frequently indicated, saline laxatives or diuretics are of use, and the consumption of large quantities of water. Possibly also a restricted diet is helpful. Supportive measures may be indicated in the grave cases and symptomatic treatment of the heart, kidneys, and the gastro-intestinal tract. As a prophylactic measure, the combination of small doses of arsenic, Fowler's solution, 3 to 5 minims (0.2 to 0.3), should be given with bromides, if the latter preparation has to be given over a long period. This measure frequently not only prevents bromide acne-like outbreak, but is helpful in causing a disappearance of the same. Locally, mild lotions and ointments may be employed, such as a saturated solution of boric acid, boric acid ointment, and, in the event of itching, 2 gr. (0.12) of menthol to the ounce (30.) of the ointment base; or phenol, 5 to 10 gr. (0.32 to 0.65) to the ounce (30.) of the lotion or ointment. Use the phenol on localized areas only.

DERMATITIS DYSMENORRHEICA.

Matzenauer and Polland, and subsequently Wise and Parkhurst, have described a curious eruption occurring in women having dysmenorrhea and manifesting itself, exclusively, during the menstrual periods. The tendency to an outbreak disappears during pregnancy. The eruption consists of erythematous patches, urticarial wheals and vesicles, usually symmetrically located on the face, and less frequently on the trunk and extremities. The treatment is largely symptomatic.

ROENTGEN-RAY DERMATITIS.

Definition.—An inflammation of the skin of varying grades of severity, produced by the action of the roentgen-rays, either from

too long or too frequent exposures, or because of unusual susceptibility.

Symptoms.—The reaction produced by exposure to the roentgen-rays is almost invariably delayed for from three to four days, and in exceptional instances does not appear for weeks or months. The mildest degree of reaction consists of a peculiar reddish erythema, resembling sunburn, which usually fades in a few days. In slightly severer instances the dermatitis persists for a week or longer, and is accompanied by burning and itching. In cases exhibiting a more severe reaction, vesiculation, swelling, or puffiness of the part may be added. Certain other lesions are not infrequently observed after a few or many exposures, such as freckle-

FIG. 59.—Chronic roentgen-ray dermatitis with amputation for squamous-cell epithelioma. (Fordyce and MacKee.)

like spots, an eczematous appearance, pigmentation, wrinkling, and atrophy of the skin. Roentgen operators after using the apparatus over a period of some years frequently exhibit a dry, rough, and somewhat reddened epidermis upon the dorsum of the hands and fingers; brittleness and thinning of the nails, and in severe instances wart-like growths, which eventually may undergo malignant changes, and in a few instances have caused death.

In extreme cases of susceptibility to the rays or after long or frequent exposures the surface develops a marked dermatitis, in reality a burn, which is followed by a slough and superficial or deep ulceration. The ulcer is sluggish, with an inflammatory border, grayish base, and may take weeks or many months to heal.

The severe types of dermatitis or burns and the resulting ulcerated surface are excruciatingly painful.

Etiology and Pathology.—Although numerous theories have been advanced as to the cause of roentgen-ray burns, in my experience the reaction has been chiefly due to the susceptibility of the patient, the closeness of the tube to the cutaneous surface, the length and frequency of the exposures, and the strength of the current.

Macleod has formulated the present knowledge of the action of the roentgen-rays as follows: In small doses they have a stimulating effect on the elements of the healthy skin; in large doses, by long exposures, close proximity of the tube to the skin, or the employment of soft tubes, the rays are capable of devitalizing the tissue elements, interfering with the process of reproduction, and causing their degeneration, and that this power is the result of a direct specific action of the rays; that the hair follicles, glands, nails, and bloodvessels are more readily and severely affected by the rays because of their differentiated character than those less differentiated as epidermal cells and fibrous tissues of the corium; that the healthy elements of the skin are stimulated to a process of repair by moderate dosage while pathologically altered cells are less resistant and devitalized; the action of the rays is cumulative and the toxins formed by the breaking down of the cells causes a secondary inflammatory reaction; the inflammation is apt to lead to ulceration and necrosis, and slow repair because of the impairment of tissues and degenerative changes in the bloodvessels by the previous action of the roentgen-rays.

Treatment.—Prophylactic treatment consists in the careful use of this important and frequently treacherous therapeutic agent. The first treatment should not be unduly prolonged so as to determine the susceptibility of the individual to the remedy. Subsequent treatments should not be given too close together, too long in duration, and with the tube too closely placed to the individual. The operator should know his coil, the character of the tube, and the technic of treatment. The length of exposure and the method of protecting the patient have been described under a former section.

The milder grades of dermatitis should be treated with some soothing application, as has been suggested under acute eczema and dermatitis. In the more severe cases a 1 per cent solution of picric acid with olive oil as the base is soothing and healing. Boric acid ointment, with 5 to 10 gr. (0.32 to 0.65) of phenol to the ounce (30.), is often useful. Orthoform, 1 to 2 dr. (4. to 8.) to the ounce (30.) of boric acid ointment or zinc ointment, may ease the pain in some instances. For the more sluggish type of case, with deep-seated ulcers, resorcin, 10 gr. (0.65) to the half ounce (15.) of lead plaster and the same quantity of petrolatum is healing and pain

relieving. Scarlet red, ointment of a 2 to 5 per cent strength, may also be employed. Curettement and skin-grafting have been employed in the long-standing cases in which there is a considerable loss of the integument.

RADIUM. DERMATITIS.

A superficial dermatitis may be caused by the alpha and beta rays. A prolonged application of radium will cause a destruction of tissue resembling that which is produced by the roentgen-rays. The gamma rays are supposedly causal of this destructive action. Pain, under these circumstances, is often severe, healing is slow, and there may be permanent changes in the skin and connective tissue. The treatment is the same as employed for roentgen-ray dermatitis.

DERMATITIS FACTITIA.

Synonyms.—Feigned eruptions; Dermatitis artefacta; Hysterical eruptions.

Definition.—An eruption artificially produced, of a mild or severe character, usually observed in a neurotic individual, and for the purpose of exciting sympathy or for malingering.

Symptoms.—An inflammation of the skin may be produced by the patient which in the most superficial form is simply an erythema and in the most severe types consists of gangrenous areas or ulcers. The degree and severity of the process depend not only upon the agent employed but also upon the strength of the irritant or solution, the duration of the application and the susceptibility of the tissues. The outbreak does not conform to any type of lesion but is of a peculiar rounded, linear or angular conformation, with very sharp borders, and in right-handed individuals within easy reach of the right hand, while the reverse is true of those using mostly the left hand. Artificial dermatitis is usually in the form of ulcers, the individual having applied some form of irritant until ulceration occurs, and the lesions are not infrequently covered by black, gangrenous sloughs. There may be one or a great many ulcers, the patient by irritant applications continuing the process, continuously or intermittently, for months or years. In one instance the writer has seen gangrenous areas self-produced on the fingers of the left hand and the toes in which amputation was necessitated. In another case fissures were produced in the interdigital spaces of the left hand of such depth that several weeks were required for healing.

Suggestion is a remarkable source of a new outbreak, the mention to the patient of the possibility of a crop of lesions occurring on

an unaffected part, usually at a subsequent visit shows the eruption on the area designated. The affection is fortunately of rather unusual occurrence.

Etiology.—The methods employed in producing the affection are extremely varied and often difficult to detect. Among those most frequently used are carbolic acid, croton oil, Spanish fly, mustard, various acids and caustics, lye, cresoline; burning with hot-water bottles, matches, hot metals, heated sealing wax, and friction with the finger nails, pieces of wood, or other rough materials. The cases are usually observed in emotional individuals, frequently

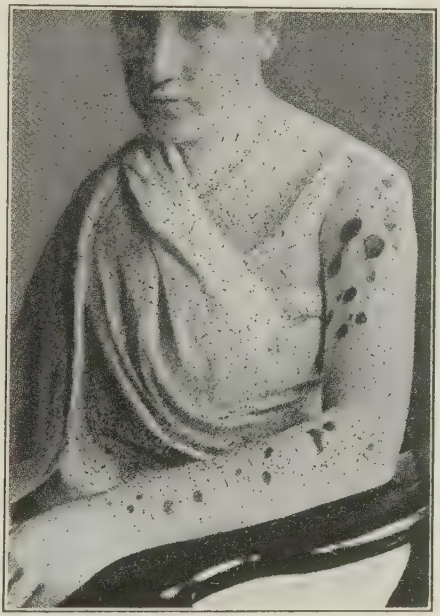


Fig. 60.—Dermatitis factitia. (Ormsby.)

in hysterical girls, for the purpose of exciting attention or sympathy, and in those who wish to avoid work by their disability.

Diagnosis.—The location, the character, particularly their curious formation, the course of the affection, and the type of the patient offers distinction from all other conditions. Furthermore, when the affected part is confined in a fixed dressing the lesions are produced elsewhere.

Treatment.—Fixed dressings are at times required to avoid the further production of lesions near the involved area. The patient should be carefully watched, and if detected in self-mutilation the lesions suddenly cease to appear because the individual has been

confronted with her failing. Mild antiseptic preparations may be applied locally.

It is frequently a rather difficult matter to prove your diagnosis because the individual is most careful in excluding herself when applying the escharotic.

Fig. 61.—Dermatitis factitia. (Courtesy of Dr. F. X. Dercum.)

NEUROTIC EXCORIATIONS.

Synonyms.—Acne urticata (Kaposi); Dugout excoriations (Colcott Fox).

Definition.—A self-produced eruption frequently followed by marked scarring.

Symptoms.—The outbreak is usually observed on the face and neck, occasionally on the limbs, chest or elsewhere on the cutaneous surface. The lesions consist of oval or irregular excoriations or ulcers, sometimes covered with a crust. Pigmentations and scars are noticeable features. The individual has an uncontrolled desire to remove some supposed foreign substance in the skin, or obtain relief from irritation, itching or burning sensations, by rubbing, pricking, or digging with the finger nail, forceps, point of a knife, scissors or other instruments. A preceding lesion may have been present on the area mutilated.

Etiology.—Cases have more frequently been observed in women of thirty years of age or older. The nervous system seems to be the disturbing agent in these individuals. Several instances have been recorded in which those afflicted believe they can dig out parasites, which are supposedly present, and thus relieve the disorder.

Diagnosis.—The condition resembles marked feigned eruptions (dermatitis factitia) excepting that the patient, in this condition, will try to hide the fact that the outbreak has been self-produced while in neurotic excoriations the afflicted individuals readily admit that they have injured themselves.

Prognosis.—Restoration of the nervous system to its normal condition would stop this self-produced outbreak and end the development of active lesions.

Treatment.—General tonics including arsenic have been given. Locally mild antiseptics and antipruritic lotions and ointments are indicated.

PURPURA ANNULARIS TELANGIECTODES.

Synonym.—Telangiectasia follicularis annulata (Majocchi).

Definition.—The characteristic outbreak consists of telangiectatic, purpuric, and atrophic lesions, usually occurring on the lower extremities.

This rare disease was originally described by Majocchi in 1896. There are about thirty cases recorded in Italian, French and German literature. MacKee reported the first case observed in America.

Symptoms.—MacKee's study of the recorded cases shows that the disease may be divided into three definite stages: The telangiectatic, purpuric and pigmentary and atrophic. The lesions first observed consist of minute red puncta, which increase in size by peripheral extension, producing lesions from split-pea to dime and larger in size. Pressure may temporarily remove the redness from the early lesions, but in the later purpuric stage the color is permanent. As the lesions enlarge there is a tendency toward central clearing and in certain instances slight atrophy is observed. The active lesions tend to disappear after the lapse of some months and pigmentation remains. The eruption is usually observed below the knees, on the anterior and lateral surfaces, occasionally the outbreak develops on the upper legs, the arms, and rarely elsewhere. Constitutional disturbances, neuralgic or rheumatic pains, on occasional instances preceded the eruption.

Annular lesions and in some instances half-circles are observed.

The disease runs a slow course, tending to clear up after several months.

Etiology.—The disease most often attacks young male adults. The affection is believed to be of toxic origin or a neurosis.

Pathology.—MacKee found in an early lesion, endarteritis, with an increase in the number of the small capillaries, edema in the corium, hyaline degeneration of the arterial walls, and perivascular cellular infiltration. In a chronic lesion the epidermis was atrophic, and in addition to the changes mentioned there were a number of hemorrhagic and pigmented areas in the corium.

Diagnosis.—The disease should be easily distinguished from syphilis and purpura.

Prognosis.—The prognosis is favorable but recurrence may occur.

Treatment.—Supportive bandaging is indicated. Mild antiseptic lotions or ointments may be required.

CLASS 3.

HEMORRHAGES.

PURPURA.

Definition.—A hemorrhage into the skin of determinable or unknown origin, accompanied by or without constitutional derangement.

The lesions observed are designated as petechiæ, vibices, ecchymoses, and ecchymomata. *Petechiæ* are rounded or oval spots from a pin-head to a dime in size; *vibices* are linear hemorrhages of varying length; *ecchymoses* are large non-elevated lesions of a rounded or irregular contour; and *ecchymomata* (hematoma) are elevated blood tumors of various sizes.

The affection can conveniently be divided into three groups, depending upon their severity: *Purpura simplex, purpura rheumatica*, and *purpura hemorrhagica.*

Purpura Simplex.—The mild form of purpura is usually unaccompanied by constitutional derangement or rheumatic symptoms; in some instances, however, there may be slight malaise, loss of appetite, etc. The attack is characterized by a sudden appearance of pin-point- to bean-sized, bright or dark red spots from which the color cannot be pressed, limited to the lower extremities, or with an associated outbreak upon the forearms. The affection usually reaches its height in a few days and the lesions then become of a bluish-red, violet-blue, yellowish-brown, and leave temporary pigmentation. The outbreak may occasionally have a circinate arrangement. In rare instances the purpuric lesions are accompanied by an outbreak of erythema multiforme or urticaria (*purpura urticans*). The affection usually runs a course of one or two weeks, exceptionally crops appear over a few months, a year or longer. There are very slight or an absence of subjective symptoms.

Purpura senilis is the term applied to the purpuric lesions that frequently appear upon the lower legs and the ankles, and exceptionally on the forearms, of old and debilitated subjects. The condition is of local origin and is usually associated with sluggish peripheral circulation or with varicose veins.

Purpura pulicosa has been used as a descriptive title for punctate hemorrhages that are caused by the bites of fleas, bed-bugs, and various other animal parasites.

Purpura Rheumatica (*Peliosis rheumatica; Schönlein's disease*). —The mildest form of purpura rheumatica or arthritic purpura is practically a purpura simplex with the addition of rheumatic pains, occasionally swelling about the joints, and mild or severe constitutional symptoms, including fever.

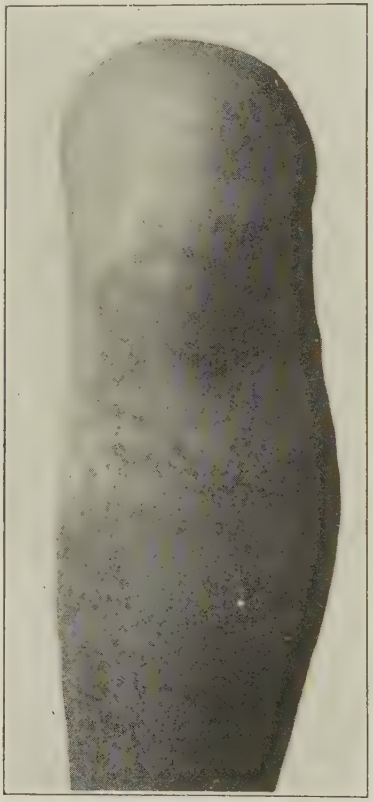


Fig. 62.—Purpura simplex.

Peliosis rheumatica, or Schönlein's disease, is characterized by multiple arthritis, a purpuric outbreak, and lesions of an erythema multiforme and urticaria types. In addition there may be nodes indistinguishable from erythema nodosum, and exceptionally vesicles or bullæ, extensive areas of angioneurotic edema (giant urticaria) with or without hemorrhagic contents. The term *febrile purpuric edema* has been applied to these cases.

The attack starts with moderate or high temperature, mild articular pains, and sore throat. The throat symptoms, in certain

instances, are severe, and sloughing of the uvula may occur (Osler). Endocarditis, pericarditis, and other symptoms of acute articular rheumatism may be present.

Henoch's purpura is closely related to Schönlein's disease, and occurs chiefly in childhood. The affection, according to Osler, is characterized by: Relapses or recurrences often extending over two years; the combination of purpura, urticaria, angioneurotic edema, and erythema multiforme, varying in intensity and in different attacks; gastro-intestinal crises; moderate joint symptoms; hemorrhage from the mucous membranes; enlargement of the spleen; and nephritis, which is the terminating cause of death.

FIG. 63.—Purpura hemorrhagica. Bleeding from the various mucous membranes. Fatal termination.

Purpura Hemorrhagica (*Morbus maculosus Werlhofii; Land scurvy*) may begin as a simple purpura without constitutional derangement, with mild systemic disturbances, or with grave symptoms. Those cases with a mild beginning may later develop moderate fever, considerable prostration, and typhoid fever may be simulated.

The lesions at the onset may be small and few in number, increasing rapidly or slowly in size and number until the greater portion of the integument is involved. Petechiæ, vibices, ecchymoses, and ecchymomata may all be observed on the skin and mucous membranes and bleeding may occur from the mucous membranes. In favorable cases the disease terminates in from ten days to two

weeks. Profound anemia may rapidly develop and death result from loss of blood or cerebral hemorrhage.

The disease has been observed in epidemics. In rarely severe instances, usually in children, the affection pursues a malignant course, terminating fatally in twenty-four hours (*purpura fulminans*).

Etiology.—The disease is not uncommon in the milder forms and is met with in both sexes and at all ages. A considerable number of cases have to be classed as idiopathic, as no etiological factor can be determined. The symptomatic causes of an outbreak may be classed under the headings of microörganismal, infectious, toxic, cachectic, neurotic, and mechanical.

The various organisms which have been found in the blood or integument associated with the condition are the pneumococcus, streptococcus, colon bacillus, anthrax bacillus, Bacillus pyocyaneus, Staphylococcus aureus and albus, and certain undifferentiated organisms.

Outbreaks have been associated with pyemia, septicemia, malignant endocarditis, and with typhus fever, measles, scarlet fever, smallpox, cerebrospinal fever, syphilis, malaria, and rheumatism.

Toxic causes consist of venomous snakebites, and various drugs such as copaiba, quinine, belladonna, mercury, ergot, salicylates, chloral, and the iodides.

Cachectic conditions have been causal as exemplified by cancer, tuberculosis, pseudoleukemia, leukemia, Bright's disease, various disturbances of nutrition, cirrhosis, lung and cardiac conditions, chronic alcoholism, and the debility of old age (purpura senilis).

The affection has been observed secondary to locomotor ataxia, acute myelitis, transverse myelitis, severe neuralgias, tuberculous meningitis, emotional and hysterical conditions, and the menstrual state.

From mechanical causes such as prolonged standing; relaxations of the bloodvessels due to intense heat, as in stokers; following paroxysms of coughing or epileptic attacks, tight bandages, etc.

Pathology.—The hemorrhage is chiefly observed in the corium, but may extend into the subcutaneous tissue. In recent attacks masses of red blood cells are demonstrable in the corium and later pigment granules. The dilated capillaries may be blocked with red blood cells, and the surrounding tissues show an inflammatory edema. Various changes have been found in the bloodvessels, endarteritis, lardaceous degeneration of the walls, thrombi, emboli, and plugging of the channels with microörganisms. Red blood cells escape from the vessels by diapedesis or through tears in the walls. The coagulation time has been retarded in certain instances.

Diagnosis.—The condition should be easily diagnosed as the affection is characterized by a hemorrhage into the skin. Scurvy is the one condition to be differentiated and is distinguished by its development in those deprived of fresh vegetables and fruits, and is preceded or accompanied by softening or sponginess and bleeding of the gums, often looseness of the teeth. The hemorrhages are usually limited to the legs, and are apt to be accompanied by brawny swelling of the parts and a tendency to break down into ulcers.

Prognosis.—Most cases, particularly those of the mild type, recover. Severe types, if developing in cachectic individuals, in those with organic lesions, or of a virulent causation, may terminate fatally.

Treatment.—The patient should be kept in bed, excepting in the mildest cases of the purpura simplex type. Liquid, semi-liquid, or the plainest kind of food is indicated. Arsenic pushed to its physiological limit has been of use, particularly in children with arthritic symptoms. Calcium chloride or calcium lactate, in 15 to 20 gr. (1. to 1.3) doses, three or four times daily to induce coagulation, are of help. Other preparations which have been employed are: Liquor adrenalin chloride 1 to 1000, 5 to 10 mimims (0.3 to 0.6), every two hours, hypodermically or by the mouth; oil of turpentine, 10 to 15 minims (0.6 to 1.) three times daily; sodium salicylate, 10 gr. (0.6) four times each day; salicin, 15 gr. (1.), given with the same frequency; ergot, tannic or gallic acids, aromatic sulphuric acid, and injections of artificial serum, 120 cc, at each injection.

To check the bleeding, in severe cases from the mouth or nose, inhalations of carbon dioxide, irrigations with a 2 per cent gelatin solution; or with a 1 to 1000 to 1 to 500 solution of adrenalin chloride, are indicated.

CLASS 4.

HYPERTROPHIES.

ICHTHYOSIS.

Synonyms.—Fish-skin disease; Xeroderma; Xeroderma ichthyoides; Ichthyosis vera; Ichthyosis congenita; Sauriasis.

Definition.—A chronic disease developing in infancy or early life, and characterized by dryness and harshness of the skin, deficiency of secretion, scaliness, follicular enlargement, and in severe instances of warty growths.

Ichthyosis is divided into *ichthyosis simplex*, the mildest form of which is designated *xeroderma; ichthyosis congenita;* and *ichthyosis hystrix*, the linear form of the latter being termed *ichthyosis hystrix linearis.*

Symptoms.—**Ichthyosis Simplex**, in its mildest aspect, consists of dryness and harshness of the skin, most marked on the extensor surface of the extremities, and to a lesser degree on other portions of the body, particularly during cold or windy weather (*xeroderma* or *xerosis*). There is frequently added to this a prominence and horny condition of the follicles, particularly on the antero-lateral portions of the thighs, and postero-lateral aspects of the arms. Scaliness and a tendency to the formation of large thin scales with turned-up edges is also observed. There is apt to be slight thickening of the epidermis and accentuation of the lines of the skin.

In severer types of the affection there is marked scaliness, thickening of the epidermis, and a greater follicular involvement. The entire body covering may exhibit these changes in a marked degree, including the face, the scalp, and even the mucous membranes of the lips. The plate-like character of the scales has given rise to the name *fish-skin disease* (ichthyosis), and in severe instances the condition has been termed *"alligator skin," ichthyosis serpentaria sauriasis* (crocodile skin); *ichthyosis scutulata* (shield-shaped). The skin in well-marked cases may be of a dirty yellow or dirty brown color, and motility is interfered with because of the dryness and thickness. Fissures may develop in the neighborhood of the joints. The skin reacts easily to all irritants, even in the mild grades of the affection. Eczematous outbreaks are common, particularly in winter. Mild or severe itching may be present.

Ichthyosis Congenita (*Keratoma diffusum; Intra-uterine ichthyosis; Harlequin fetus*).—In rare instances ichthyosis is present at birth and presents the most severe example of the affection. The surface is covered with thick, scale-like plates and numerous fissures. It is difficult for the child to open the mouth because of the dryness and thickness of the skin. Ectropion and fissures may be present at all of the external orifices. Infants exhibiting this affection are frequently prematurely born, and usually live but a few days or weeks, death resulting from inanition, because of the tenseness of the skin and mucous membranes of the mouth which interfere with nursing, and from loss of heat.

Fig. 64.—Ichthyosis.

Hebra and Kaposi have reported cases which somewhat resemble the above with the title of *ichthyosis sebacea*, or seborrhea squamosa neonatorum, in which there is an abnormal accumulation of vernix caseosa. The skin is tense, incrusted, with painful fissures, and of a brownish-red color. These cases terminate fatally unless the incrustations are removed by ointment and the body is artificially heated.

In other instances the infant is born with a collodion-like or oiled-paper-like membrane covering the skin, but this coating peels off in sheets, and after a short period of desquamation the skin

assumes a normal aspect. The latter, although resembling, is distinct from ichthyosis.

Ichthyosis Hystrix is characterized by the development of localized or somewhat generalized patches, of varying size and shape, which consist of thickened, rough, wart-like, papillary elevations. The underlying skin is harsh, dry, and thickened, and to a lesser extent the same condition of the integument may be observed between the

FIG. 65.—Ichthyosis hystrix. (Courtesy of Dr. R. L. Sutton.)

patches, or the intervening cutaneous surface may be normal. In some of its aspects it resembles closely a horny nævus.

Ichthyosis hystrix linearis, or linear ichthyosis, differs clinically from ichthyosis hystrix in that it occurs in bands or streaks. Cases of this type have been variously designated as *linear verrus, nævus unius lateralis, nævus nervosis, ichthyosis linearis neuropathica, papilloma lineare, papilloma neuropathicum unilaterale, nævus*

verrucosus, nævus papillaris, papilloma neuroticum, etc. *Linear nævus* is usually unilateral in distribution, and may involve large or small portions of the cutaneous surface. The various explanations offered to explain the character and distribution of these lesions is the influence of the cutaneous nerves, of the blood supply, the lines of cleavage of the skin, or following the trend of growth of the tissues.

Exceptionally ichthyosis, or a condition synonymous, is observed developing in middle or late life, particularly in natives of the Sandwich Islands who chew piper methysticum. Circumscribed areas of ichthyosis may be associated with neuritis or tabes; these latter probably are distinct from true ichthyosis, as they originate in chronic inflammatory processes. Chronic palmar and plantar ichthyosis have been described under *keratosis palmaris et plantaris. Ichthyosis linguæ* has been given under leukoplakia.

Etiology.—The disease is congenital and a hereditary tendency can be determined in some of the cases. Hutchinson believed that the disease takes its origin during intra-uterine life, and is so mild in certain cases that its presence is not detected until a short or a considerable period after birth. Marked congenital cases are rare. Acquired ichthyosis is extremely rare. In instances of family tendency the affection may follow exclusively the male or female lines.

Pathology.—There is marked thickening of the horny layer, the pressure from this overgrowth thinning and flattening the underlying layers. There are also slight inflammatory changes in the corium.

Diagnosis.—Very little difficulty should be experienced in diagnosing the condition if the congenital nature of the affection, the non-inflammatory character, the dryness, scaliness, roughness, and in extreme cases the wart-like appearance, are found.

Prognosis.—The condition tends to continue during the life of the individual; in a few instances the tendency decreases toward middle life, and in a few cases cure has been reported. Most cases are worse during the cold weather.

Treatment.—If the tone of the system is in any way lowered, tonic treatment may be indicated; such preparations as cod-liver oil, iron, quinine, and arsenic are prescribed. Pilocarpine hydrochlorate, $\frac{1}{50}$ to $\frac{1}{30}$ gr. (0.0012 to 0.002), three or four times daily, has been administered to promote glandular activity. Thyroid extract 1 or 2 gr. (0.06 to 0.12), three times daily, has also been used.

Locally baths and lubricating ointments are indicated. The patient should take a warm bath daily, soaking for from twenty minutes to a half hour. Bran or hyposulphite of soda baths, 3 quarts to each bath, are of use. A most efficient ointment consists of salicylic acid, 5 to 10 gr. (0.32 to 0.65); lanolin, 2 dr. (8.); petro-

latum, 6 dr. (24.). Where the patches are rather thick, particularly upon the extensor surfaces, the following is useful: Salicylic acid, 10 to 20 gr. (0.65 to 1.3); precipitated sulphur, 20 to 30 gr. (1.3 to 2.); lanolin, 2 dr. (8.); benzoinated lard, 6 dr. (24.). In the hystrix variety a 20 per cent salicylic-acid plaster; or resorcin, 20 to 40 gr. (1.3 to 2.6); salicylic acid, 40 to 60 gr. (2.6 to 4.); lead plaster and petrolatum, each ½ oz. (15.), may be indicated.

ACANTHOSIS NIGRICANS.

Synonyms.—Keratosis nigricans.

Definition.—A rare disease characterized by pigmentation, warty growths, and usually associated with cancer.

The condition was originally described by Pollitzer and Janovsky.

Symptoms.—The affection begins rapidly or slowly. The involved areas become of a brownish color, thickened, and covered with papillomatous growths, which may be discrete or form blackish wart-like masses, of a more or less symmetrical distribution. The face, neck, back of the hands, the commissure of the lips, and the deep folds of the skin are chiefly attacked. Between the involved areas the skin may be pigmented or normal. The palms and the soles may exhibit wart-like lesions without pigmentation. The oral mucous membrane is markedly involved and covered by papillomatous growths resembling closely acuminated condylomata. There may be nutritional changes in the nails and partial or complete hair loss. Freckles, seborrheic warts, and telangiectases may accompany the outbreak. The general health in the beginning is unaffected, but later there are symptoms of cachexia.

Etiology.—The majority of the cases have developed in women between the ages of thirty-five and fifty years. Carcinoma of the abdominal viscera is present in most instances.

Pathology.—There is a thickening of the horny layer, of the rete cells, and infiltration of the corium, with the presence of a few mast cells. Intracellular and extracellular pigment granules are present in the rete and the corium.

Prognosis and Treatment.—A fatal termination is to be expected because of the presence of carcinoma. Treatment is, therefore, without avail. Suprarenal extract may be tried.

CLAVUS.

Synonym.—Corn.

Definition.—A circumscribed hypertrophy of the horny layer of the skin.

Symptoms.—A corn differs from other callous areas only in regard to its size and conical formation: the base is directed upward and

its apex downward. There are two varieties of corns, the *hard* and the *soft*. The former is usually observed on the dorsal surface of the toes or on the plantar aspect of the foot; one or more being present. The usual site of soft corns is on the lateral surface of the toes. It is centrally depressed and of a grayish color, the moisture of the part causing the softness. The hard corn is slightly or considerably raised above the surrounding surface, and is smooth or rough, and of a yellowish or grayish color. Corns are frequently painful, particularly during climatic changes, pressure on the nerve filaments producing the sensation. Corns may become infected by improper handling and erysipelas or a spreading cellulitis result.

Etiology and Pathology.—Corns result from pressure and friction, particularly from ill-fitting shoes.

A corn consists of dense conical masses of horny epidermis, with an underlying obliteration and surrounding hypertrophy of papillæ.

Treatment.—To alleviate the soreness there is nothing better than the official ichthyol plaster, and to cause softening of the horny layer salicylic acid plaster. The plaster is worn for four days; it is then removed, the corn soaked in hot water for from twenty to thirty minutes, and all of the whitened area scraped away with the flat surface of a needle. The procedure is then repeated until the corn is eventually removed. Another valuable prescription consists of salicylic acid, ½ to 1 dr. (2. to 4.); lead plaster and petrolatum, each ½ oz. (15.). The corn may be protected by a felt ring. Pressure over the bones of the toes or on affected areas should be carefully avoided to prevent the formation of corns after their removal. In the treatment of soft corns a dusting powder is of use, containing salicylic acid 10 to 20 gr. (0.65 to 1.3); powdered boric acid, 1 dr. (4.); powdered talcum, 1 oz (30.).

CALLOSITAS.

Synonyms.—Callosity; Callus; Tyloma; Tylosis; Keratoma.

Definition. A hypertrophy of the horny layer of the skin caused by friction or pressure

The palms, the soles, the fingers, and the toes are the usual sites of these hard, horn-like patches; they may be somewhat elevated in the center and fade off into the sound skin. The callous areas may be produced by occupation. Rarely ulceration develops beneath the horny areas.

Pathology and Treatment.—There is hypertrophy and increase in density of the horny layer, thickening of the granular layer, and because of pressure, thinning of the rete mucosum, and the papillæ.

The same methods may be employed as suggested under clavus. The roentgen ray has a softening tendency in certain instances.

KERATOSIS PALMARIS ET PLANTARIS.

Synonyms.—Tylosis palmæ et plantæ; Ichthyosis palmaris et plantaris; Keratoma palmare et plantare hereditarium; Symmetrical keratodermia.

Definition.—A rare disease, characterized by a roughened and horny condition of the palms and the soles.

Symptoms.—The affection is almost invariably symmetrical in distribution, limited to the palms and soles, and exceptionally the

FIG. 66.—Keratosis palmaris et plantaris. Palms also involved.

dorsal surface over the joints. The whole palmar surface and the plantar surface, to the exclusion of the arch, are involved by thickened, smooth or roughened, and pitted, yellowish, yellowish-brown, or yellowish-gray callous areas, of a leathery or horn-like consistency. These horny plates may be extremely thick; on the heels one-quarter inch or more in thickness. Hyperidrosis may be associated on the affected parts and the hypertrophic epidermic masses are then sodden and macerated. An inflammatory areola may be observed in certain instances around the thickened patches, and the condition

has then been termed by Besnier *keratodermia symmetrica erythematosa,* and by Brooke *erythema keratodes* of palms and soles. The nails are usually more or less involved and raised by the thickened epidermis beneath the free border. There are no subjective symptoms, but locomotion may be interfered with and the motion of the hands somewhat impaired. Fissures are observed in some cases.

An apparently allied affection, termed *mal de Meleda,* is endemic on the island of Meleda, off the coast of Dalmatia, which is of congenital origin, and in addition to the symmetrical keratoses of the palms and soles, black dots, corresponding to the opening of the sweat orifices, are present on the involved areas, and thickening of the skin over the dorsal surface of the wrists, ankles, elbows, and knees.

Etiology and Pathology.—The condition may be congenital or acquired. Heredity plays an important part in etiology, several cases being observed in the same family or in preceding generations. I have seen three children in the same family attacked. In the acquired form, the long-continued use of arsenic and hyperidrosis, friction and pressure, have been thought contributing factors.

The histological changes are those found in callosities.

Diagnosis.—The symmetrical character of the outbreak, the absence of inflammatory symptoms, the frequent association of hyperidrosis, its early beginning, and the hereditary history differentiate it from callosities, squamous eczema, and thickened areas associated with other diseases.

Prognosis and Treatment.—Various drugs have been suggested for internal administration, such as large doses of arsenic, ichthyol, in 3-minim doses (0.18) three times daily, and pilocarpin, but with slight or no improvement. The condition is practically incurable, but can be much helped by stimulating external applications. Salicylic acid in the form of a plaster, 10 to 25 per cent, or 1 dr. (4.) to the ounce (30.) each of lead plaster and petrolatum, or with 1 dr. (4.) of resorcin added. The thickened areas can be excised with a knife or burned off with the actual cautery. Pyrogallol plaster, 40 per cent, may be employed.

KERATOSIS SENILIS.

Definition.—Keratosis senilis, or old-age changes in the skin, is characterized by the development of freckle-like spots on the exposed portions of the body which tend in certain instances to undergo malignant change.

Symptoms.—Circumscribed yellowish-brown, reddish-yellow, non-elevated or slightly raised, slightly scaly spots, few in number or

numerous, develop on the face, exceptionally on the neck, and the dorsal surface of the hands and the fingers. The spots vary from a split-pea to a small finger-nail in size, and are covered with a yellowish or brownish greasy scale, and are termed a degenerative seborrhea patch (*seborrhea degenerativa*). These patches may remain stationary over a period of months or years, new areas being added from time to time, or become covered with a thicker scale of a dark-brown color. This scale eventually, in certain cases at least, becomes roughened and wart-like (*keratosis senilis*).

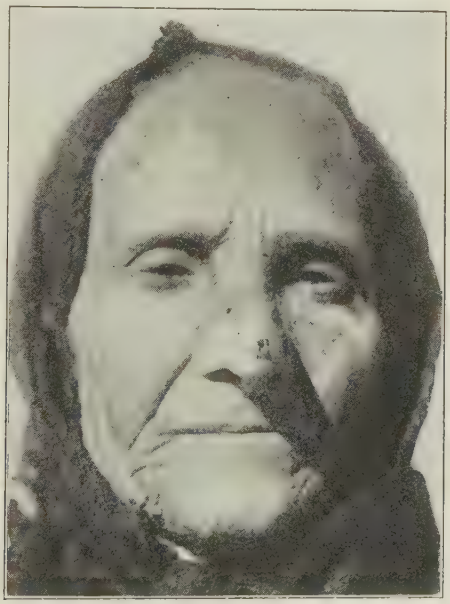


FIG. 67.—Keratosis senilis. Dorsal surface of hands also involved.

These wart-like areas tend in quite a proportion of instances to break down in the center, ulcerate, and become epitheliomatous (*rodent ulcer*).

Etiology.—Any individual after the age of sixty, and occasionally in the neighborhood of forty years, is subject to these degenerative old-age changes in the skin. Those who have led an outdoor life are more prone to the affection, and the changes are observed at an earlier age. Some skins seem to have an unusual idiosyncrasy to an outbreak, while in others lack of proper cleanliness seems predisposing.

Prognosis.—The condition tends to last over many months or years in the first or degenerative seborrhea stage, also for a long

period in the wart-like stage, but there is a greater or lesser tendency in all cases to eventually undergo a malignant change.

Treatment.—The treatment depends upon the stage of the affection present, mild applications suffice in the superficial type of lesions, stronger in the thicker or wart-like lesions, and the treatment in the beginning or fully developed epithelioma stage is described under that disease.

FIG. 68.—Keratosis senilis which has progressed into an epithelioma; patient, aged seventy-one years. The wart-like keratoses have been present for many years.

An efficacious method of treating the superficial patches consists of painting once each week with salicylic acid, 10 to 20 gr. (0.65 to 1.3), in flexible collodion, 1 oz. (30.), and giving an ointment to be applied, twice daily, of salicylic acid, 10 gr. (0.65); precipitated sulphur, 15 gr. (1); lanolin, 2 dr. (8.); petrolatum, 6 dr. (24.); or salicylic acid, 10 gr. (0.65); ammoniated mercury, 20 gr. (1.3);

benzoinated lard, 1 oz. (30.); or a lotion containing zinc sulphate and potassium sulphuret, each 10 gr. (0.65) and water, 1 fl. oz. (30.).

The thicker areas are treated with the same preparations, only in stronger solutions. The salicylic acid in the collodion mixture being made 1 dr. (4.) to the ounce (30.); in the ointments the salicylic acid is increased to 20 gr. (1.3), the precipitated sulphur to 30 or 40 gr. (2. to 2.6); ammoniated mercury to 40 gr. (2.6), and the zinc sulphate and the potassium sulphuret to 15 or 20 gr. (1. to 1.25) each to the ounce (30.). Trichloracetic acid may be applied to the wart-like cases in certain instances. Carbon dioxide snow has also been used with benefit. The roentgen-rays or radium are curative in all stages of the affection.

KERATOSIS PILARIS.

Synonyms.—Pityriasis pilaris; Lichen pilaris.

Definition.—A roughened condition of the skin, chiefly attacking the extensor surfaces, and characterized by horny papules surrounding the openings of the hair follicles.

Symptoms.—Pin-head-sized or slightly larger, acuminate, or flattened, rough, grayish, or, from the admixture of dirt, blackish papules, occasionally with a hyperemic base, are observed on the thighs, legs, and arms. They are usually discrete, and the intervening skin may be harsh and dry, slightly scaly, and the surface feels like a nutmeg-grater. Most of the papules are pierced by a lanugo hair, or plugging of the summit prevents its exit and causes irritation. When the horny plug is removed a depression remains.

Etiology and Pathology.—The texture of the skin and the lack of sweat secretions combined with cold weather tend toward the production of the outbreak. Insufficient bathing makes the condition worse or predisposes to an attack.

Diagnosis.—The affection could hardly be mistaken for any other, because of its non-inflammatory character, its usually limited distribution, and its presence chiefly during the winter months.

Treatment.—Frequent bathing with warm water and thoroughly rubbing the surface with a rough wash-cloth, and in severe cases an ointment containing 5 to 10 gr. (0.32 to 0.65) of salicylic acid and equal parts of lanolin and petrolatum, each $\frac{1}{2}$ oz. (15.)

KERATOSIS FOLLICULARIS (DARIER'S DISEASE).

Synonyms.—Keratosis vegetans; Ichthyosis follicularis; Ichthyosis sebacea cornea (Wilson); Acne sebacee cornee; Psorospermosis; Psorospermose folliculaire vegetante; General hypertrophy of the sebaceous system.

Definition.—A rare disease, running a chronic course, usually of symmetrical distribution, and characterized by horny follicular papules.

The disease was described in 1889 by J. C. White and Darier independently, and since then about fifty examples of the affection have been recorded.

Symptoms.—The primary lesion is a pin-head- to pea-sized papule resembling markedly those found in keratosis pilaris. The papules originally may be the color of the skin, later greasy-looking or dry, firm, brownish in color, and contain a central, hardened, fatty-looking plug. The lesions may become confluent and present an irregular papillomatous surface, covered with a thick, grayish, or brownish horny scale, and associated fissuring. Some of the lesions may be rounded or flattened, instead of acuminate, dull red or dark brown in color, without the central opening, while others are hard or horn-like, of a dark gray or dark brown shade, and considerably elevated. Eventually large horny masses may be formed.

In the early stage of development the lesions may show depressed follicular openings filled with concretions. Infections may occur and ulceration and purulent discharge result. Lesions in all stages of development will be observed in marked cases. Where the outbreak is abundant and coalescence into hypertrophied papillomatous masses has occurred an offensive odor of decomposing epithelium or sebaceous matter is present. The disease has frequently started on the head and face and slowly, after months or years, extends more or less generally or may remain limited in distribution. The most abundant outbreak is usually observed upon the face, the scalp, the anterior portion of the chest, the loins, the genitocrural regions, and on the extremities. A seborrheic scale is observed on the scalp and also the follicular papules. Subjective symptoms are mild or absent.

Etiology and Pathology.—Most cases develop in males, under the age of puberty, and in several instances, in infancy. No hereditary evidence can be determined in most cases.

Darier found coccidia-like bodies in the lesions which he originally thought were causal and termed the affection psorospermosis. These bodies have since been proved by Piffard, Bowen, and also by Darier, to be atypical forms of cornified epithelial cells.

The process is an epithelial hyperplasia, beginning in the neck of the hair and sebaceous follicles, and resulting in a peculiar parakeratosis. Changes are observed in late lesions extending in the epidermis beyond the follicular openings. There is an increased deposit of pigment in the epidermis and the corium. In the largest lesions there is a proliferation of the rete and a slight cellular infiltration of the corium.

Diagnosis.—The condition is differentiated from *keratosis pilaris* by the confluent areas of papillomatous lesions, its distribution and general characteristics. *Molluscum contagiosum* is excluded by the pearly lesions, few in number and chiefly in the vicinity of the eyebrows. Ichthyosis, lichen planus, and pityriasis rubra pilaris can be readily excluded by recalling the type and distribution of the lesions.

Prognosis and Treatment.—The disease is persistent and extremely rebellious to treatment. The general health is not affected, but late in life, in a few instances, malignant changes have occurred. The same therapeutic measures should be carried out as are recommended under the severe instances of ichthyosis and ichthyosis hystrix. The roentgen-rays have proved of benefit in certain instances.

Keratosis Follicularis Contagiosa.—Brooke has described a rare affection, apparently of contagious nature, occurring chiefly in children, frequently several in one family, and sporadically in adults. There is a thickening of the horny layer, with the development of yellowish to yellowish-black discolorations of the skin and comedo plugs seated at the follicular openings and papular elevations with horny projections. The neck, the trunk, and the extensor surfaces, and less frequently the face and the flexor aspects, are attacked. The horny changes are not alone limited to the follicles, but extend to the surrounding epidermis and into the sweat pores.

Histologically the lesions resemble markedly those of keratosis follicularis, but the psorosperm-like bodies are absent. Frequent bathing and the application of an ointment containing 10 gr. (0.65) of salicylic acid to the ounce (30.) of benzoinated lard is curative.

KERATOSIS PUNCTATA.

Synonym.—Keratoderma punctata.

Hallopeau and Claisse, in 1891, described a peculiar keratosis of the palms and soles, which was characterized by the development of numerous minute crateriform pits, with patchy thickening of the horny layer.

The disease may attack either sex and any age. It apparently is related to the nævus group. The condition is extremely difficult to eradicate.

VERRUCA.

Synonym.—Wart.

Definition.—Warts are papillary growths with a horny covering, varying in size, shape, and consistency.

Warts are divided into several varieties because of difference in their clinical appearance: *Verruca vulgaris, verruca plana, verruca plana juvenilis, verruca digitata, verruca filiformis, verruca acuminata, verruca necrogenica.*

Verruca Vulgaris is the usual variety of wart observed, and is approximately pea in size, occasionally larger or smaller, with a rounded or somewhat flattened contour, usually with a roughened, horny surface, at times distinctly papillomatous, and of a brownish or grayish color. Warts occurring on the soles are hard, smooth,

FIG. 69.—Verrucæ. Lesions disappeared under a few roentgen-ray exposures. Patient aged ten years.

with a pitted surface, frequently painful, with hypertrophied papillæ in the center and a surrounding horny ring; they resemble corns or callous areas, and are designated plantar warts or *verruca plantaris.* The common wart most frequently attacks the hands and the fingers, and also the scalp and face. The mucous membranes of the lips and tongue may be involved.

Verruca Plana, or flat warts, is the term applied to the pea to finger-nail-sized and larger growths, slightly or moderately elevated, observed most frequently upon the back and face of middle-aged and elderly individuals. These lesions are apt to be covered with

a rough, dark brown or black, greasy scale, frequently smooth or at times papillomatous. They are frequently associated with other degenerative changes which have been described under *keratosis senilis* (old-age changes in the skin), and are termed keratosis pigmentosa, verruca senilis, seborrheic wart (*verruca seborrheica*).

Verruca Plana Juvenilis are flat, occasionally rounded warts having an irregularly shaped base, of a whitish-yellow, grayish or brownish color, discrete or confluent, exceptionally forming linear patches, frequently numerous, slightly elevated or even with the skin surface, pin-head to pea in size, and occasionally with a very slight central depression. The face is usually attacked and at times the dorsum of the hands. They are usually observed in young children or in early adult life. This type of wart may persist, untreated, for months or years.

Verruca Digitata is a wart with marked hypertrophy of the papillæ and consists of separate finger-like projections arising from one base; it is usually of a dirty gray or brownish-black color. Separation of the projections readily causes bleeding. It is most often observed upon the scalp.

Verruca Filiformis is a thread-like growth, most commonly found on the face, the eyelids, or the neck. It consists of one or more hypertrophied papillæ, projecting considerably above the surrounding skin, and is usually soft and flexible.

Verruca Acuminata (*Condyloma acuminatum; Venereal wart; Moist wart; Pointed wart; Pointed condylomata; Fig-wart; Cauliflower excrescence*).—So-called *venereal warts* are observed most frequently upon the genital and anal regions, the glans penis, the clitoris, and occasionally on the flexure surfaces, the axillæ, the mouth, and between the toes. They usually result from uncleanliness, irritating discharges, and in association with venereal diseases. The growths are single or multiple, of a pinkish, reddish, purplish or grayish color, and consist of raspberry-like, cauliflower-like, or flattened elevations, of varying size and shape. As the usual sites of attack are moist, the lesions may be somewhat macerated and covered with an abundant yellowish, seropurulent discharge having an offensive odor. The excrescences bleed readily. In some cases the discharge dries and thick reddish-yellow or brownish crusts are formed. They usually develop rapidly and remain more or less stationary after reaching a certain size. The affection is contagious and does not disappear spontaneously. Several organisms have been mentioned as causal.

Verruca Necrogenica is a warty, tuberculous growth described under tuberculosis of the skin.

Etiology and Pathology.—Warts are found most frequently in childhood and early adult life. Experiments tend to prove that they are slightly contagious and probably of an organismal cause.

Verruca acuminata, or *venereal warts,* are probably a distinct affection etiologically from other varieties of warts. These verrucæ and their secretions are distinctly contagious and auto-inoculable. In addition to Staphylococcus pyogenes aureus and Bacillus subtilis, Ducrey and Oro have found in the secretions two unknown microörganisms.

Warts consist of hypertrophy of the vascular papillæ, the epidermis, the rete and the horny layer, and an imperfect cornification. There is also dilatation of the vascular and lymphatic channels in the corium. The digitate and filiform warts have a richer connective tissue core and blood supply than the others.

Venereal warts are made up largely of connective-tissue elements, marked papillary enlargement, excessive development of the rete, an abundant vascular supply, and differ from other warts in an absence or lack of hypertrophy of the horny layer.

Diagnosis.—Warts are distinguished from moles because of their hardness, lack of true pigmentation, and their later development instead of a congenital origin. Lichen planus is readily differentiated by the shiny, violaceous lesions. Molluscum contagiosum has a central opening through which its contents can be expressed, thus differing from a wart. The characteristic features of xanthoma, xanthoma diabeticorum, and angiokeratoma separate these affections.

Treatment.—Warts may be removed by excision, electrolysis, freezing with carbon dioxide snow or liquid air, by acids, the roentgen-rays, radium, and by plasters. There is no better method in a great many instances than by means of the electric needle: The needle is inserted several times parallel to the surface into the growth until the blood supply is destroyed and the color of the lesion becomes changed. In the snow method deep pressure and one-half to one minute exposures are suggested. Although numerous acids have been employed, the best is trichloracetic, applied until the surface of the wart turns white, the surrounding skin being covered with vaseline to prevent the acid from running over the surface. Salicylic acid plasters soften the surface of the wart so that acids may be more readily applied, or if persisted in will eventually remove the growths. Where there are a large number of lesions, particularly those of the flat variety, the roentgen-rays or radium is curative.

In treating the acuminate wart or *venereal wart,* frequent bathing with warm water and soap and the application of a dusting powder is required. One of the best applications consists of: Calomel,

10 to 40 gr. (0.65 to 2.6); salicylic acid, 10 to 20 gr. (0.65 to 1.3); boric acid, 1 dr. (4.); powdered talcum, 1 oz. (30.); or an ointment containing 10 to 20 gr. (0.65 to 1.3) of calomel; salicylic acid, 5 to 10 gr. (0.32 to 0.65); petrolatum, 1 oz. (30.).

CORNU CUTANEUM.

Synonym.—Cutaneous horn.

Definition.—Cornu cutaneum is a horny outgrowth of the skin of varying size and shape.

Symptoms.—The lesion resembles a miniature horn and is curved or twisted, with a rough surface, grayish or black in color, and elevated $\frac{1}{8}$ to $\frac{1}{4}$ of an inch, exceptionally several inches, above the cutaneous surface. It is firmly attached, and the surrounding skin may be normal or somewhat inflamed. It may be shed spontaneously or from suppurative changes in the base. Usually but one is present, exceptionally several, and found most frequently on the face or scalp, at times elsewhere. The growth is usually slow, in certain instances rapid, and after reaching a certain size it remains stationary. The base may eventually undergo a malignant change.

Etiology and Pathology.—They usually develop in old age, most frequently arising from senile keratoses or horny warts. They may also originate in scars, sebaceous or fatty cysts, or in other lesions. They are of rare occurrence.

Treatment.—The growth should be excised and the base cauterized with caustic potash or chloride of zinc.

SYNOVIAL LESIONS OF THE SKIN.

Hyde and subsequently Lingenfetter and Ormsby have recorded a curious condition which occasionally develops in the neighborhood of the joints, particularly on the dorsal aspect of the interphalangeal and metacarpo-phalangeal, articulations. The lesions are smooth or wart-like, cystic tumors and always situated over the site of bursæ. Puncturing of the lesion causing the exudation of a yellowish-brown, syrupy fluid. The cyst tends to refill. Overdistention may cause pain.

Cure is effected by complete excision of the lesion, by the roentgen-rays or radium.

POROKERATOSIS.

Synonyms.—Hyperkeratosis eccentrica; Keratodermia eccentrica; Hyperkeratosis figurata centrifuga atrophicans.

Definition.—A disease which consists of one or more slowly spreading patches, with elevated horny borders and more or less depressed centers.

The affection was described both by Mibelli and Respighi in 1893.

Symptoms.—The disease begins as small, superficial, slightly elevated, wart-like elevations or as thin callous spots. Eventually after a considerable period, sometimes months or years, the lesions suddenly spread peripherally, forming rounded, square, or irregularly shaped, coin or larger-sized patches, consisting of a horny ridge and an atrophic center. The horny ridge may be grooved and divided into lateral halves or broken in its continuity. Minute blackish horny concretions or papillary horn-like projections may be found in the ridge or the central portion of the lesion. The horny portion of the epidermis is thickened and may be scaly or smooth.

The hairs may disappear and there is a decrease or absence of sweat and sebum secretion in the involved areas. The border of the patch is a dirty grayish or blackish color, while the central portion is of a light gray or pinkish hue. There may be one or more patches present which spread gradually, but eventually remain stationary. The condition tends to improve during the warm weather. Spontaneous involution rarely occurs. The areas usually attacked are the dorsum of the hands and the feet, exceptionally also the palms, the soles, the face, the limbs, the trunk, and rarely the mucous membranes. On the later areas there is a surrounding zone of hyperemia.

Etiology and Pathology.—The disease is extremely rare in this country but of more frequent occurrence in Italy. There is hereditary influence in certain instances. It is suggestive of a bacterial infection, but experiments have so far proved negative.

There is a hyperplasia of the epidermis, with an associated hypertrophy of the mucous, granular, and horny layers.

Diagnosis.—The affection does not resemble any other cutaneous outbreak.

Prognosis and Treatment.—The lesions without treatment tend to persist indefinitely. Excision, electrolysis, or curetting, followed by strong preparations of salicylic acid, are the methods suggested.

ANGIOKERATOMA.

Synonyms.—Keratoangioma: Lymphangiectasis: Verrues telangiectasiques; Tuberculides angiomateuses.

Definition.—An affection usually attacking the extremities and characterized by telangiectases and subsequent wart-like growths.

Symptoms.—The affection starts as pin-point- to pin-head-sized discrete, closely crowded telangiectases, of a pinkish or purplish color. Later wart-like growths develop over the dilated capillaries.

Some of the lesions may coalesce and form a pea-sized and larger patch covered with irregular horny projections. There may be numerous lesions on the affected parts. The outbreak is usually observed upon the dorsum of the fingers and toes. The palms, the soles, the scrotum, the ears, the forearms, and the legs may show involvement. Exceptionally pedunculated vascular tumors and nævus-like growths may be present. Subjective symptoms are absent.

Fig. 70.—Angiokeratoma of scrotum. (Courtesy of Dr. R. L. Sutton.)

Etiology and Pathology.—The disease is rare, developing in the young, and exceptionally in those past middle age. There has apparently been a hereditary tendency in a few instances. The affection has in most cases been observed in those with vascular disturbances which cause peripheral congestion and is induced by cold or in those subject to chilblains. The association with tuberculosis of the internal organs has been suggested (Frohwein).

There is a thickening of the horny layer and hyperplasia of the rete, and dilatation of the bloodvessels. Cavernous spaces are found in the upper corium and occasionally in the rete; these may be filled with blood.

Prognosis and Treatment. The malady tends to persist indefinitely; exceptionally a few of the lesions may disappear.

The negative pole of the electric needle is inserted into the lesion, and a current of from 2 to 5 milliampères causes their destruction with a good cosmetic result. Trichloracetic acid will likewise cause a cure

SCLERODERMA.

Scleroderma differs considerably in its clinical aspects, in some instances exhibiting more or less diffused, hard, board-like areas,

Fig. 71.—Localized scleroderma. (Courtesy of Dr. C. N. Davis.)

while in others the patches are sharply circumscribed or consist of bands, having a lardaceous appearance, with a pinkish border, and exceptionally a combination of the two. Although in certain cases these types may more or less approach each other, it has been thought best to describe the two conditions separately, the first being known as *diffuse symmetrical scleroderma* and the later as *morphea or circumscribed scleroderma.*

Diffuse Symmetrical Scleroderma. — **Synonyms.** — Hide-bound skin; Dermatosclerosis; Chorionitis; Scleriasis; Sclerema adultorum.

Definition.—A condition characterized by diffused board-like thickening of the skin and subcutaneous tissues.

Symptoms.—The disease may begin slowly or rapidly, with or without preceding rheumatic pains, prickling or tingling sensations, muscular cramps, and various neurotic disorders. Exceptionally, also, vesicles, blebs, scales, local hyperidrosis, and loss of sensibility develop in the area to be attacked. The skin and subcutaneous tissue, usually on the upper portion of the body, becomes involved by a gradually increasing induration or by a firm edema, which pits under pressure but later becomes hard and tense as leather. The integument is shiny, smooth, waxy, of an alabaster-like dirty yellow or grayish color. The thickened area usually fades off into the sound skin, the process extending subcutaneously at the periphery.

The affection may rapidly involve extensive areas or the greater portion of the integument; in most cases, however, it spreads slowly, years passing in the process, from one region to another, until a large portion of the body is involved, or it may remain stationary after reaching a certain development. The face when extensively involved may be immobile and expressionless, board-like to the touch, and mastication is difficult. Respiration may be impaired by inability to expand the chest because of the hide-bound condition of the skin. There is at times such extensive involvement of the shoulders, the arms, the hands, and the fingers that motion is impaired or impossible; the arms are flexed and also the fingers, and the latter have a claw-like appearance (*sclerodactylia*). The patient then becomes practically helpless, particularly when the lower extremities are likewise immobile. Sweat secretion may be lessened or absent on the attacked regions. The lesions are at times accompanied by subcutaneous tubercles, eczema, erysipelas, whitening of the hair, Raynaud's disease, erythematous lupus, herpes zoster, and acne. The mucous membranes of the mouth and vulva are in certain instances attacked. Later in the affection the skin becomes stretched, thinned, and atrophied, dry, scaly, and even ulcerated. The muscles may eventually waste; the teeth fall; and the fingers and arms are permanently flexed. In these late stages, neuralgic and rheumatoid pains develop, the patient's health is impaired and internal complications, usually renal, cardiac, pulmonary, or marasmus, cause death.

Etiology and Pathology.—The cause of the affection is unknown. A large proportion of cases occur in women, usually in the young or middle-aged. The changes in the skin are apparently due to vascular changes, probably due to a lesion or defect of the nervous system. The various causes which have been mentioned are rheumatism, climatic changes, neurotic conditions, traumatism, injury

of the nerves, extreme exposure to the sun, Graves' disease, Raynaud's disease, leprosy, Addison's disease, focal infections and various other morbid states.

An increased amount of pigment is found in the epidermis, and there is a decrease in the size of the corium bloodvessels and changes in their walls by pressure from an infiltration of cells. The latter also surround the sweat and sebaceous glands, the hair follicles, and are found in the subcutaneous fatty tissue; atrophy of these structures tends to occur from pressure. The white fibrous and elastic tissues and muscular fibers are increased in the corium.

Diagnosis.—Sclerema neonatorum can be distinguished because it is observed in the new-born and the surface is cold. Other diseases can be easily differentiated if the character of the lesions and the course of diffused scleroderma are considered.

Prognosis.—The affection runs a course of months or years, and in a considerable number of cases spontaneously disappears. In those instances which have progressed to the atrophic stage a fatal termination usually results from marasmus or intercurrent disease.

Treatment.—The preparations which have been most frequently employed are arsenic and thyroid extract. In certain cases they have proved of benefit, if given in large doses over a considerable period. Occasionally potassium iodide, in 10 gr. (0.65) doses, and 2 gr. (0.12) of desiccated thyroid, three or four times daily, are of use. If the outbreak is not too extensive careful and mild roentgen-ray treatment may be tried.

Morphea.—Synonyms.—Circumscribed scleroderma; Addison's keloid.

Definition.—A disease characterized by the development of one or more discrete, well-defined, yellowish-white patches, with a surrounding lilac or violet-colored areola, and running a persistent course.

Symptoms.—Patches usually begin as rosy or violet-colored macules which spread peripherally, either rapidly or slowly, until finger-nail and larger-sized, rounded, oval, irregular, or more or less linear areas are involved. The center of the patch becomes whitened, resembling old ivory, usually depressed, at times elevated, while the circumference remains of the original hue. The lesion is infiltrated, lardaceous in appearance, dry, smooth, traversed by very delicate lines, and occasionally is dotted with depressed points resembling the patulous openings of the sebaceous glands. The skin of the affected area may eventually become atrophied and have the appearance of scar tissue. The condition runs a chronic course, lasting for months or years. The face, sides of the neck, the chest, the abdomen, and the extremities are the sites

usually attacked, particularly the first two. Cases exhibiting several areas may show symmetrical or asymmetrical distribution. Facial atrophy may be an associated condition (hemiatrophia facialis). Subjective symptoms of itching, tingling, prickling, and neuralgic pain are mild or absent.

White spot disease (*morphea guttata*) is an affection closely resembling an unusual clinical type of morphea, although it has been described as a separate disease by Westburg, and later by Montgomery, Johnston, and Sherwell. The eruption occurs chiefly on the anterior surface of the chest, the neck, and the shoulders. The plaques are chalk-white or snow-white, pin-head to split-pea in size, of an oval, round, or irregular, or linear formation, tending to extend peripherally, with clearing in the center, and may eventually become the size of a silver dollar. The lesions may remain discrete or coalesce. The patches may be slightly elevated, nonelevated, or slightly depressed, sharply marginated, dry, and covered with glistening epithelium, frequently exhibiting at their circumference slightly projecting points or ridges, and a few have a hyperemic areola. Atrophy of the involved areas may eventually occur, and keloid is simulated. There is an absence of tactile sensation over the plaques. Typical patches of morphea are at times associated. The histological changes resemble markedly morphea.

Etiology and Pathology.—The causes of morphea are unknown. The affection is more common in women, particularly those of a nervous temperament or in those with some nerve derangement. Local irritation is thought to be causal in some instances, such as the constriction of garters, the friction of shoes, of corsets, neckbands of clothes, etc.

The histological picture resembles that found in diffused scleroderma. Pressure of infiltrations of cells and increased fibrous tissue cause a constriction of the bloodvessels, the glands and the follicles, and therefore an anemia of the involved areas. The bloodvessels surrounding the diseased areas are dilated, causing a collateral hyperemia.

Diagnosis.—The lardaceous appearance of the patch, with the surrounding pinkish or violet border, differentiates the disease from leukoderma, vitiligo, scars, and keloid.

Prognosis.—The lesions ultimately disappear, frequently without atrophy, although the condition may run a chronic course over months or years.

Treatment.—Therapeutic measures are often disappointing. In certain instances, however, brilliant results are obtained, after a more or less prolonged period, from the internal administration of arsenic or thyroid extract and the local application of the roentgen-rays.

Arsenic is usually administered in the form of the solution of the arsenate of potassium or sodium or arsenic trioxide, $\frac{1}{20}$ gr. (0.003), four times daily, or the cacodylate of soda; the two former in 5- to 10-minim (0.32 to 0.65) doses, three to four times daily, and the latter in 1- to 3-gr. (0.06 to 0.18) doses, hypodermically, weekly or bi-weekly. Other methods which have been suggested are galvanism, electrolysis, massage, and the injection of thiosinamin.

SCLEREMA NEONATORUM.

Definition.—A disease characterized by a more or less generalized firm infiltration of the skin, developing at or shortly after birth.

Underwood first described this rare affection.

Symptoms.—In most instances, within the first or second week after birth, the skin becomes livid or whitish-yellow in color, resembling wax, and of a leathery consistency. The disease usually starts on the legs and spreads generally, with the exception of the palms, the soles, and the scrotum. The greatest rigidity of the integument is observed upon the face and the extremities. Feeding and deglutition are at first difficult and eventually impossible. The respirations and the pulse are shallow and imperceptible, and the temperature markedly subnormal. There may be an associated icterus and often sprue. Diarrhea is usually an associated symptom.

Etiology.—The condition has been ascribed to a lessened fatty acid content of the fat tissues due to bad hygienic surroundings, improper nourishment of the mother, and to premature birth, cardiac weakness, atelectasis, diarrhea, and pneumonia of the infant.

Pathology.—Parrot attributes the condition to desiccation of the tissues from diarrhea or other causes. He found the skin thinned, excepting in the horny layer, and contraction of the bloodvessels, especially of the papillary layer.

Prognosis and Treatment. Congenital cases are usually born dead. Cases developing after birth die in a few days, excepting in those few instances, limited in extent, which may recover.

Treatment consists in raising the body temperature by artificial heat in an incubator, wrapping the body in wool, and warm baths, and by nourishment through a tube passed through the nose or mouth.

EDEMA NEONATORUM.

Definition.—An affection characterized by a somewhat limited diffuse edema of the skin, developing at or shortly after birth.

Parrot differentiated the affection from sclerema neonatorum in 1877.

Symptoms.—The infant between the first and third day after birth develops drowsiness, and is awakened from sleep with difficulty, and there is an associated pallor, coldness, and lividity, at times, redness, deep yellow or dirty appearance of the integument, with edema, and a tendency to hardening. The affection usually begins in the lower extremity, and the hands, the palms, the soles, the genitalia, and the lower portion of the back become attacked. It rarely becomes universally distributed, but in most instances is limited to the areas mentioned. Drowsiness increases, the circulation and respirations become weak, and the temperature subnormal. Jaundice, erysipelas, pemphigoid eruptions, purpura, gangrene of the skin, and high fever may complicate the condition.

Etiology and Pathology.—Premature birth, cardiac weakness, atelectasis, exposure to cold, and improper nourishment of the mother have been mentioned as causal. Nephritis, hereditary syphilis, and various infectious diseases have been associated with the condition.

There is circulatory obstruction, such as venous thrombosis, a serous effusion into the subcutaneous tissues, and the fat is of a thickened consistency and darker color than normally.

Diagnosis.—The condition is differentiated from sclerema neonatorum by the edema of the tissues, with the characteristic pitting under pressure, the more or less limited distribution, and the tissues are much less stiff and immobile.

Prognosis and Treatment.—According to Soltmann, between 80 and 90 per cent of the cases terminate fatally.

The treatment is the same as suggested under sclerema neonatorum.

ELEPHANTIASIS.

Synonyms.—Elephantiasis arabum; Pachydermia; Buenemia tropica; Barbadoes leg; Morbus elephas; Elephant leg; Elephantiasis indica; Spargosis; Hypersarcosis; Cochin-leg.

Definition.—Hypertrophy of the skin and subcutaneous tissues caused by circulatory disturbances and obstruction of the lymphatics.

The filarial form of the affection has been described under the parasitic diseases.

Symptoms.—The disease usually develops without constitutional involvement but may begin with chills, prostration, delirium, and fever. The latter severe systemic involvement is more apt to be found in the filarial form of the disease, or in the type following recurrent attacks of erysipelas (*elephantiasis nostras*). There is enlargement of the affected part and hypertrophy of the tissues,

without pitting unless there is a superadded edema. The attacked areas are normal or of increased firmness, the skin may remain smooth and unchanged in the beginning or mild instances. In severe cases, particularly of the extremities, the integument becomes hard and sclerotic, with a papillary hypertrophy, of a wart-like appearance. The latter changes are usually observed upon the leg and foot. Fissures, eczematous areas, and ulcers may be added to the condition chiefly when the lower extremity is attacked. The legs, genitalia, the face, and the arms are the areas prone to show involvement. The condition may be limited to one part, such as the foot, the foot and the leg, or exhibit a bilateral and rather extensive distribution. There may be enlargement of the lymphatic glands contiguous to the attacked area. The facial involvement resembles true edema, excepting for the absence of pitting, and has been termed "solid or persistent edema." The lips may exhibit a marked expression of the disease. The disease develops slowly and is usually requires months or years to reach the extreme types of the affection. There may be a persistent edema for a considerable period previous to the hyperplastic changes. Recurrent attacks of lymphangiectasis almost always precede the condition. All of the pathological changes are much less marked than in the filarial form.

Congenital elephantiasis (elephantiasis lymphangiectodes) or elephantiasis telangiectodes consists of hypertrophy of the affected parts, enlargement and redness, dilatation of the bloodvessels, and it is almost invariably of congenital origin.

Etiology and Pathology.—Elephantiasis, of non-filarial causation, usually develops in males in early adult and middle life, and is produced by any condition that induced persistent obstruction of the lymphatic system. A considerable proportion of cases are due to repeated attacks of erysipelas or are secondary to inflammation caused by streptococci. Other etiological factors are chronic ulcers, chronic tuberculous or syphilitic inflammations, obstruction by the pressure of neoplasms or contracted scars, extensive removal of the lymphatic glands, and as a congenital anomaly.

There is extensive increase of dense fibrous tissue, surrounding the dilated lymphatics, a consideralbe quantity of round or spindle, and plasma cells, and leukocytes. Thickening of the corium and subcutaneous tissue and a matting together of the various structures. Fatty degeneration and atrophy of the underlying muscles may supervene.

Diagnosis.—The condition is distinguished from acromegaly by the symmetrical distribution of the latter on the face, feet and hands, and no lymphatic involvement. Myxedema is excluded by other symptoms of that affection.

Prognosis.—The condition persists and in certain instances tends to progress unless the cause is removed.

Treatment.—Removal of the cause and operative interference.

TROPHEDEMA (MEIGE).

A rare disease characterized by chronic edema and a subsequent induration, tending to attack the lower extremities, and exceptionally the upper extremities and the face. There may be neuralgic pains and an exaggeration of the tendon reflexes. There are no subjective symptoms and the condition after reaching a certain development remains stationary for years. A similar condition has been observed with anterior poliomyelitis and lesions of the spinal cord. Spontaneous disappearance may occur. Massage of the affected parts is suggested.

MYXEDEMA.

Synonyms.—Cretinoid edema; Cachexia thyroidea.

Definition.—A constitutional affection, induced by insufficient thyroid tissue, and accompanied by edematous swelling, thickening, and induration of the skin and subcutaneous tissue. The disease was first clearly described by Sir William Gull in 1873.

Symptoms.—The condition usually develops slowly, with generally poor health, anemia, sluggishness of movement, unsteady gait, slow and halting speech, and mental hebetude. The temperature may be subnormal, and there is often an accompanying glycosuria or albuminuria. These symptoms may be mild or severe and only a few or all present. "Bolsters" of fat are observed at the sides and back of the neck. The scalp hair may become harsh, and scanty, and alopecia ensue. The sight, hearing, digestion, and muscular strength are at times impaired. The nails are grooved, discolored, and cracked. The teeth are often carious, fragile, and lost.

The skin becomes yellowish and waxy, thickened, firmly edematous, not pitting on pressure, and swollen. The neck, face, and extremities are the parts usually attacked. The lips, the nose, the eyelids, and also the tongue, the uvula, and the fauces exhibit thickening. The integument later in the affection may be more or less pigmented, either locally or in widely distributed areas.

Etiology and Pathology.—The disease is of unusual occurrence, developing chiefly in middle life and mostly attacking the female sex. The condition is caused by interference with the function of the thyroid gland. Derangement of the nerve centers has also been attributed as the causal factor.

The thyroid gland is reduced in size and its glandular structure impaired by fibrous changes.

There is slight atrophy of the epidermis, a round-celled infiltration of the upper corium, and an obliterating endarteritis. There is a deposit of fluid, supposedly mucin, in the superficial connective tissue. The epithelium of the sweat and sebaceous glands is swollen and proliferated, and these emunctories eventually become occluded. The hair follicles and nerves may show a similar process.

Diagnosis.—Myxedema is distinguished from elephantiasis by the changes in the thyroid gland, the fatty lumps, waxy appearance of the skin, and the constitutional symptoms. Acromegaly involves the osseous system. Leprosy runs an entirely different course; tubercles and the bacillus lepra can be found.

Prognosis and Treatment.—The prognosis is favorable if thyroid is given in sufficient quantity and over a long period. Desiccated thyroid gland is given in 3- to 5-gr. (0.18 to 0.3) doses, three or four times daily. In certain instances the administration of the cacodylate of soda, 1 to 3 gr. (0.06 to 0.18) three times daily in association with the other medication, is suggested. Electricity and massage of the affected parts will prove of use.

DERMATOLYSIS.

Synonyms.—Loose skin; Cutis laxa; Cutis pendula; Pachydermatocele; Chalazodermia.

Definition.—A rare disease characterized by hypertrophy and looseness of the skin and subcutaneous tissue.

Symptoms. The skin may hang in loose folds or have a normal or pigmented appearance, but sufficiently elastic to allow of stretching a foot or more beyond the surrounding surface. The integument is usually thickened, but exceptionally is thinner than normal. It may be the seat of molluscum tumors, and is either insensitive or painful. The functions are preserved. The anomaly is frequently limited to the face, the neck, the abdomen, or the genital region. The condition may be somewhat progressive or, after reaching a certain development, remain stationary.

Etiology and Pathology.—The etiology is unknown; in certain instances it is congenital, in others acquired. A trophoneurotic origin has been suggested, as in the acquired cases it has started at the point of traumatism. It has been thought to be related to fibroma, in certain instances at least.

There is hypertrophy of all portions of the integument, particularly the subcutaneous tissue. There is a considerable amount of fibrous and soft lipomatous tissue present.

Diagnosis.—In senile conditions and after pregnancy or tumors the skin is somewhat relaxed but the subcutaneous tissues are relaxed rather than the skin. Elastic skin (*cutis hyperelastica*) is a closely allied affection.

Prognosis and Treatment.—The disease is progressive or after reaching a certain growth remains stationary. Treatment consists of excision of the superabundant skin and suturing.

ACROMEGALY.

Definition.—A rare affection characterized by hypertrophy of the bones and soft parts. The disease was first clearly described by Marie.

Symptoms.—The disease usually starts insidiously without constitutional symptoms. The bones and soft parts, particularly of the face, the hands, and the feet, occasionally the arms and the legs, and exceptionally the trunk, are increased in size and thickness, sometimes becoming enormously hypertrophied. The nails are often thick, flattened, and grooved longitudinally. The hair is of coarser texture than normally, more abundant, and widely distributed. Pigmentation may be present in spots or covering large areas. The sweat glands have an increased activity. The ears, nose, under lip, tongue, and larynx may exhibit enlargement. The eyes are at times prominent, and articulation indistinct.

Etiology and Pathology.—Derangement of the pituitary body, the thymus gland, nerve and cerebral lesions have been suggested as causal.

There is hyperpigmentation of the prickle layer and hypertrophy of the epidermis, corium, and fibrous tissue. The arteries, veins, and nerve sheaths are thickened. In certain instances the muscles, bloodvessels, and nerves are degenerated.

Diagnosis.—The disease is easily differentiated from elephantiasis and myxedema by the bone changes.

Prognosis and Treatment.—The affection either remains stationary after reaching a certain growth or is progressive. The various gland extracts may be administered, but without much hope of betterment. Extract of the posterior lobe of the pituitary gland may help more than any other preparation.

CLASS 5.

ANOMALIES OF PIGMENTATION.

LENTIGO.

Synonyms.—Freckles; Ephelides.

Definition.—Freckles are yellowish, brownish, or blackish, circumscribed pigmented spots.

Symptoms.—The pigmented areas are from pin-head to split pea and larger in size, and are usually observed on the exposed portions of the body, the face and the hands, exceptionally on the covered parts. They are most often seen between the ages of ten and twenty years, and may be sparsely scattered over the involved regions or in large numbers. Freckles appear most frequently during the summer months, disappearing or becoming fainter during the winter months, or persist indefinitely without change.

Pigmented freckle-like spots are also observed associated with the old-age changes in the skin. A special form of lentigo frequently attacks the covered parts in fibroma molluscum, and is an early symptom of xeroderma pigmentosum.

Etiology and Pathology.—Exposure to the light and the heat of the sun, acting upon a susceptible skin, causes pigmentary changes. An allied outbreak is produced by roentgen-ray exposures. The cause of lentigo of the covered parts is unknown. Lassar suggests a congenital predisposition to these pigment changes which requires external conditions for their development.

Pathologically an increased amount of pigment is found in the rete layer of the epidermis.

Treatment.—Three methods are suggested to improve or eradicate the condition; electrolysis, a peeling ointment, or stimulating lotion. A weak current, from 1 to 3 ma., is employed. The following preparations are of use: Ammoniated mercury and bismuth subnitrate, each 1 dr. (4.); lanolin, 2 dr. (8.); cold cream, ½ oz. (15.); the bichloride of mercury, ¼ to 1 gr. (0.016 to 0.16); salicylic acid, ½ to 1 dr. (2. to 4.); alcohol, 1 fl. oz. (30.); resorcin, ½ to 1 dr. (2. to 4.), may be added to the latter, but temporarily darkens the skin. These remedies should be used carefully, as they may cause irritation of the skin.

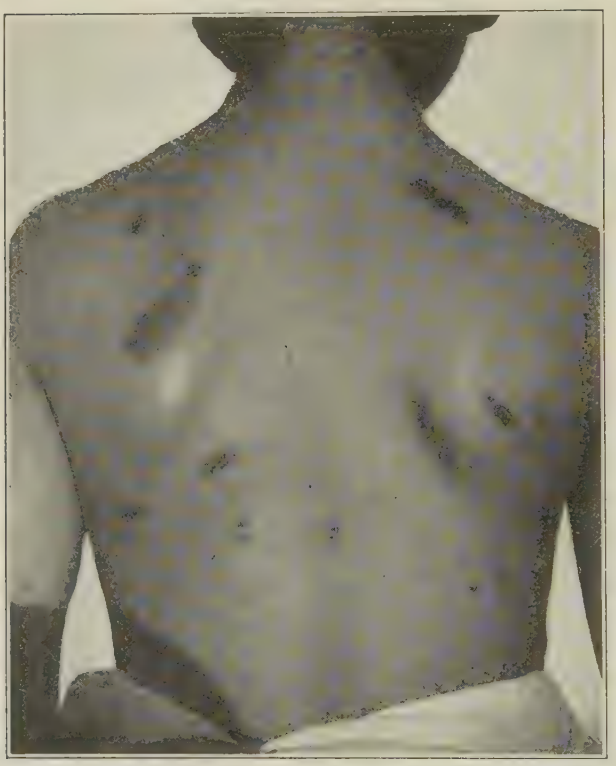


FIG. 72.—Lentigo (freckles). Face only slightly involved. Girl, aged twelve years. Duration eight years. Sections showed no derangement of the skin excepting an increased amount of pigment. Plate I is a section from this patient.

CHLOASMA.

Synonyms.—Moth patches; Liver spots.

Definition.—An affection characterized by pigmented spots or diffuse pigmentation of the skin.

Symptoms.—Smooth, non-elevated, yellowish, brownish, or blackish patches, the latter termed melasma or *melanosis* of varying size and shape, appearing usually slowly, at times rapidly. The spots may be sharply marginated or fade off into the sound skin. The patches are observed in most instances on the face, although no portion of the cutaneous surface is exempt, and in certain instances the mucous membranes are attacked. The diffuse variety of the affection may involve the trunk or a considerable portion of the integument.

The type associated with uterine and ovarian disorders usually attacks the face, and occasionally the breasts and the genitalia.

In *Addison's disease* the skin is either bronzed generally or it is most pronounced on the face, the neck, the scrotum, the groins, the axillæ, and surrounding the nipple. The mucous membranes of the lips, the gums, and other portions of the mouth may be attacked.

In *Graves' disease* there may be diffuse pigmentation or freckle-like spots, with associated telangiectases.

Bronze diabetes, which is characterized by general bronzing of the skin, is a sequela of diabetes mellitus and hypertrophic cirrhosis, and was originally described by Hanriet and Chauffard. Osler has shown that diabetes and the bronzing of the skin is a late phenomenon, due to a disease termed hemochromatosis, characterized by accumulation of an iron-containing and an iron-free pigment.

Etiology and Pathology.—Etiologically the affection has been divided into idiopathic and symptomatic chloasma.

Idiopathic chloasma is the term applied to the hyperpigmentation of external origin, such as from and following exposure to the heat and actinic rays of the sun, the roentgen-rays (*chloasma caloricum*), sinapisms, blisters, and certain drugs (*chloasma toxicum*), the hyperemia or irritation due to pressure, friction, scratching, parasites, and following certain diseases, chronic eczema of the legs, lichen planus, generalized exfoliative dermatitis, leprosy, scleroderma, etc.

Symptomatic chloasma is the pigment deposited in the skin secondary to internal conditions, such as are observed in association with tuberculosis, secondary syphilis, sarcoma, cancer (*chloasma cachecticorum*), malaria, Addison's disease, Graves' disease, functional and organic affections of the utero-ovarian system (*chloasma uterine*), with pregnancy (*chloasma gravidarum*), chronic alcoholism, etc. Jaundice also is productive of a yellowish discoloration of the skin and mucous membranes.

The pathological changes are the same as found in lentigo, only the pigmented areas are larger. The origin of the pigment in these conditions is still undetermined, whether migratory pigment conveying cells are responsible or the pigment granules themselves migrate. The cells obtain their pigment from the hemoglobin of the blood.

Diagnosis.—The diagnosis should be clear, as pigmentation is the only clinical symptom.

Prognosis and Treatment.—The removal of the cause of the affection is essential if a cure is to be effected. The individual has to be treated according to the internal or external cause of the affection. The preparations mentioned under lentigo can be employed on localized areas of pigmentation.

Mongolian pigment spots are occasionally observed in infants of darker races, particularly in the Mongolian race, and are characterized by bluish areas of pigmentation over the sacrum and buttocks.

TATTOO MARKS AND POWDER STAINS.

Tattooing is the mechanical introducing of coloring matter, consisting of carbon, cinnabar, carmine, and indigo into the skin, which results in a permanent pigmentation.

Powder, coal dust, and similar stains produced by accidental embedding into the integument of particles of coloring substances, usually carbon, are essentially the same as tattoo marks. Whitish stains may also be produced by the precipitation of lead into the tissues.

Histologically the skin shows large particles of pigment in the corium, the subcutaneous tissue, and also in the contiguous lymphatic ganglia.

Tattoo marks have to be destroyed by mechanical means, by a destructive inflammatory process, or excised. Variot tattoos a concentrated solution of tannic acid into the mark, and then vigorously rubs a nitrate of silver pencil over the surface. Brault employs a solution of chloride of zinc, 30 gr. to 40 gr. of water. This solution is tattooed into the mark. An inflammatory reaction follows which results in the destruction of the pigment and a scar. Ohmann-Dumesnil has suggested the use of a ferment. Electrolysis or the electrocautery may be tried.

In treating powder stains the individual particles of pigment have to be picked out with a needle or sharply pointed knife.

ARGYRIA.

Argyria is the term applied to the permanent bluish-gray or slate-colored pigmentation of the skin which follows the prolonged administration of the nitrate of silver. The first manifestation is a bluish line at the margin of the gums, and the generalized discoloration of the skin develops gradually.

Etiology.—The continued local application of the drug, as well as the internal administration, has caused the anomaly.

Pathology.—There is an abundant deposit of particles of metallic silver in the corium, the subcutaneous tissue, the mucous membranes, and the internal organs.

Diagnosis.—The affection has to be differentiated from the blue or slate-colored pigmentation associated with cirrhosis of the liver and the pancreas.

Prognosis and Treatment.—The condition is permanent and treatment is without avail.

ALBINISMUS.

Synonyms.—Albinism; Complete congenital leukoderma; Congenital leukopathia; Congenital leukasmus; Congenital achromia.

Definition.—Congenital absence of the pigment of the skin, the hair, and the eyes.

Symptoms.—The covering of the entire body is milky-white, with frequently a pinkish tinge. The hair is very fine, soft, whitish or yellowish, and exceptionally of a reddish hue. The irides are colorless, pinkish, or light blue, and the pupils, because of lack of pigment in the choroid, are pinkish and reddish. Photophobia and nystagmus are prominent features. The subjects of the affection may be in poor physical condition and their mentality below normal.

Etiology and Pathology.—The disease is evidently of hereditary origin; several cases may be observed in the same family or in ancestors. Recently I have had under observation three cases in one family. Both the negro and white races are attacked by the affection. Fright and shock during pregnancy have been suggested as causal.

The skin is normal excepting for complete absence of pigment.

Prognosis and Treatment.—The absence of pigment is permanent, and therapeutic measures are without avail.

LEUKODERMA.

Synonyms.—Achromia; Leucasmus; Partial albinism; Piebald skin.

Definition.—A partial congenital absence of pigment in the skin.

Symptoms.—The integument shows one or more milky-white spots, of various size and shape, which exceptionally may follow the distribution of certain cutaneous nerves. Hairs located in the whitened areas, such as on the scalp, may exhibit the same anomaly. The patches are apt to be of a circular contour, and the scalp, the face, the breasts, and the genitalia are the sites usually attacked.

Etiology and Pathology.—The condition is congenital and the cause unknown. The skin is normal excepting for the lack of pigment.

Prognosis and Treatment.—The condition is persistent and remedies have no effect.

VITILIGO.

Synonyms.—Acquired leukoderma; Leukopathia; Acquired leukasmus; Acquired achromia; Acquired piebald skin.

Definition.—An acquired affection characterized by the development of patches without pigment.

Symptoms.—The affected areas are milky-white in color, irregular or rounded in contour, small or large, and frequently surrounded by an areola of increased pigmentation. The hairs in the affected patches usually exhibit the same change, although they may remain

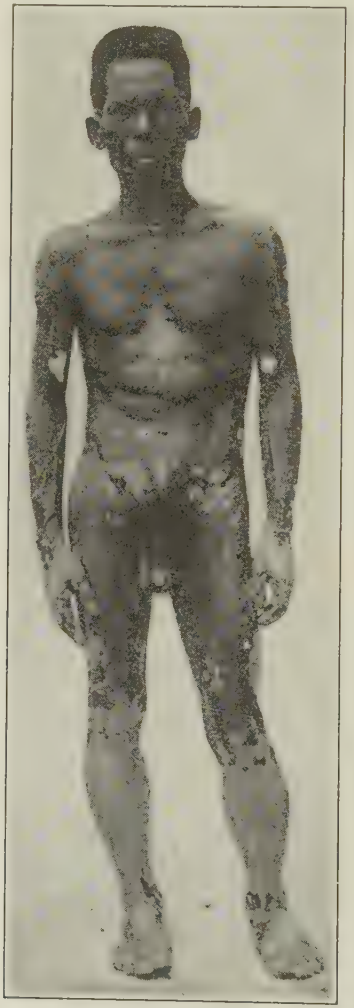


FIG. 73.—Vitiligo. (Courtesy of Dr. E. B. Vedder.)

normal in color. There may be present but one or many non-pigmented spots. The usual sites of attack are the backs of the hands, the face, the neck, and the arms, and they may be distributed more or less symmetrically. The patches tend to increase in

size and the tendency for new areas to develop may last over months or years; rarely the entire cutaneous surface is involved.

Etiology and Pathology.—The affection is most frequently observed in brunettes and negroes rather than in the blond type, and between the ages of ten and forty years. The cause of the disease is unknown, but it is probably a trophoneurosis. Various factors have been mentioned as causal; neurotic disturbances, and heredity. It has followed or been associated with alopecia areata, morphea, psoriasis, migraine, retinitis pigmentosa, toxic neuritis, malaria, scarlet fever, typhoid fever, Addison's disease, Graves' disease, hysterectomy, sunstroke, and after exposure to extreme cold.

Histologically there is an absence of pigment in the patches and an increased amount of pigment surrounding them.

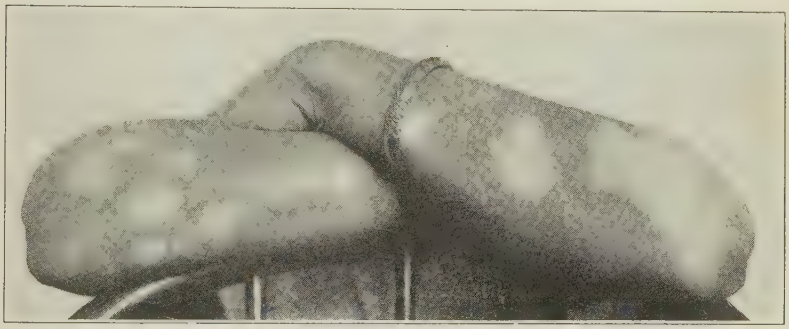


Fig. 74.—Vitiligo.

Diagnosis.—The affection is distinguished from leukoderma by its acquired character; and from albinism because it is not congenital and does not show the lack of pigment in the eyes. There are no changes in sensation such as is characteristic of anesthetic leprosy. Morphea exhibits parchment-like patches, an old ivory aspect or denseness of the integument, dilated bloodvessels, and a violaceous areola.

Prognosis and Treatment.—The prognosis is unfavorable, as treatment has to be continued over a long period to induce even slight improvement.

The preparations usually administered are arsenic, pilocarpin, thyroid extract, and suprarenal extract. Locally, galvanism, the negative pole over the patch, has been employed. The areas have been made less noticeable by treating the surrounding hyperpigmentation with the remedies mentioned under lentigo. The white spots are somewhat disguised by staining with a weak solution of walnut stain or chrysarobin. A saturated solution of the hyposulphite of soda may also be tried.

CLASS 6.

ATROPHIES.

DIFFUSE IDIOPATHIC ATROPHY.

Synonyms.—Acrodermatitis chronica atrophicans; Atrophia maculosa cutis; Anetodermia; Erythematodes; Erythromelia.

The malady was first described by Buchwald in 1883.

Symptoms.—The affection is characterized by a primary atrophy, without preceding inflammation. Atrophic patches or streaks slowly but steadily multiply, coalesce, and extend until an extensive surface is involved. The disease usually has a symmetrical distribution. The affected areas are slightly depressed, of a bluish-red color, thin, wrinkled, with enlarged veins coursing over the surface. The lanugo hairs are reduced in number and the cutaneous glands disappear in the involved areas.

Pick has described a special form of the affection, in which the skin atrophies, is of a bluish-red color, coursed by a plexus of enlarged veins, and spreads up the leg, starting at the ankle.

Etiology and Pathology.—The cause of the disease is unknown, although exposure to cold and a congenital origin have been cited. The general health is not affected, and the disease attacks individuals in middle life.

There is an inflammatory cell infiltration surrounding the blood-vessels in the corium and a disappearance of the elastic fibers.

Diagnosis.—The condition should be differentiated from scleroderma and syringomyelia.

Treatment.—Treatment offers very little relief.

GLOSSY SKIN.

Synonyms.—Atrophoderma neuriticum.

The knowledge of this affection is due to Paget, Weir Mitchell, Morehouse, and Keen.

Symptoms.—The affection in most instances attacks the hand and one or more fingers. The affected skin is red or of a red and white mottled appearance, smooth, dry, thinned, and shiny, resembling somewhat chilblains. Retraction of the skin over the distal phalanges causes the terminal extremity of the finger to appear thin and drawn away from the nail bed. There are atrophic changes in

the sebaceous and sweat glands, the hair is lost over the phalanges, the surface is excoriated, and ulceration may result. The malady is generally preceded or accompanied by neuralgic or burning pain of the affected part which is frequently severe.

Etiology and Pathology.—The affection is due to disease or injury of the nerves of the affected area, usually following one or two weeks after a neuritis or injury from a gunshot or other wound. The condition may be associated with leprosy, gout, or rheumatism.

Prognosis and Treatment.—The course of the affection is usually prolonged over months or years, but in most instances spontaneous disappearance eventually results. Treatment consists in removing the cause and protective measures.

ATROPHIA SENILIS.

Synonyms.—Senile atrophy of the skin; Atrophoderma senile.

Symptoms.—The skin becomes of a dull yellow or yellowish-brown color, furrowed, wrinkled, dry, inelastic, readily raised from the subcutaneous tissues or hangs in loose folds, and may exhibit a mild desquamative tendency. The hairs may fall from the involved areas. Other old-age changes, including telangiectases, which have been described under keratosis senilis, are frequently associated. The face, dorsum of the hands, the genitalia, the anus, and the lower extremities are usually the areas of greatest involvement. Itching may be an associated symptom.

Etiology and Pathology.—The changes are rarely observed under the age of forty years, and frequently at a much later period. Individuals with little subcutaneous fat and a naturally dry skin exhibit the condition at an earlier age, and in a more marked degree.

There is thinning of the epidermis and corium, and shrinkage of the subcutaneous fat. The papillæ are flattened and the connective tissue shrunken. Pigment granules are found in the corium and the walls of the bloodvessels. These channels are oblitered in certain portions of the skin and enlarged in others.

Treatment.—Treatment consists in eradicating the harshness and dryness of the integument by means of a bland ointment containing 5 to 10 gr. (0.32 to 0.65) of salicylic acid and ½ oz. (15.) of lanolin and petrolatum.

STRIÆ ET MACULÆ ATROPHICÆ.

Synonyms.—Atrophic lines and spots; Atrophoderma striatum et maculatum; Atrophia maculosa et striata; False cicatrices.

Symptoms.—Lines and streaks develop which are pearly and bluish-white in color, thin, glistening, and level with the cutaneous

surface or slightly depressed. They are usually not more than ¼ inch in width and vary from 1 to more inches in length, and tend to follow the lines of cleavage of the skin. Their development is insidious, without accompanying symptoms, persistent in course, symmetrically located, usually multiple, and in certain instances numerous. The hips, the buttocks, the upper portion of the thighs, and less frequently the neck, the trunk, and the extremities, are attacked. Bunch has recorded the occurrence of these streaks of cutaneous atrophy over both patellæ (*striæ patellares*).

The macular type of the affection is much less common than the striated variety. The atrophic spots vary in size from a quarter of an inch or smaller in diameter to a large coin. They are few in number, somewhat isolated in distribution, and are usually observed upon the extremities and occasionally on the trunk.

Etiology.—The affection develops in both sexes and usually in middle life, exceptionally in childhood. The most familiar example is that known as *lineæ albicantes*, observed in association with mechanical causes, usually due to distention of the skin, such as from pregnancy (*lineæ gravidarum*), anasarca, and the rapid accumulation of fat. At times they follow severe illness, such as typhoid fever, either from rapid accumulation of fat during convalescence or because of nutritional changes in the skin. Certain traumata have been causal.

Pathology.—Kaposi has found separation of the connective-tissue bundles of the corium, obliteration of the papillæ, diminution in the number of the vessels, the glands, the adipose globules, and atrophy of the epidermis.

Prognosis and Treatment.—The lesions remain permanently and are unaffected by treatment.

KRAUROSIS.

Synonym.—Kraurosis vulva.

Symptoms.—This affection, which was first described by Briesky in 1885, consists of an atrophy of the skin of the external genitalia in women, usually accompanied by intense itching. The affected area shows marked shrinkage, sometimes sufficient to cause constriction of the vaginal orifice. The labia minora, the clitoris, and the preputium clitorides become shrivelled and atrophied, and the two latter may disappear, leaving two furrows and a minute depression. Gray, roughened leukoplakic plaques may develop, and the surrounding skin is usually dry and of a whitish or reddish-gray color.

Etiology and Pathology.—The cause of the disease is unknown, excepting that pruritus and vaginal discharge usually precede the

outbreak. The condition develops both in married and unmarried women, and has no relation with pregnancy or coitus. Ovarian disease or derangement and also senile changes in the skin have been cited as causal.

The histological changes, according to Breisky, show atrophy and sclerosis in the upper part of the corium, especially the papillary portion, a cellular infiltration, and disappearance of the glandular structures.

Prognosis and Treatment.—The atrophic changes remain permanently and the patches of leukoplakia, in certain instances, tend to undergo a malignant change.

Treatment consists of excision, curettement, cauterization, and applications of the roentgen-rays or radium. The various antipruritic preparations mentioned under pruritus may be indicated for the itching. If a vaginal discharge is present it should be alleviated by douches.

ATROPHY OF THE FATTY LAYER OF THE SKIN.

Gilchrist and Ketron and later Sundwall have reported instances of this affection. Pea-sized or larger, irregular or rounded, bluish-tinted, slightly depressed macules, which fade away into the sound skin, were observed. Later, larger sunken, morphea-like patches, of a rounded, irregular or band shape, were noted. The outbreak was observed on the lower extremities. The histological changes were almost entirely limited to the subcutaneous fat, and consisted of infiltration with large phagocytic cells (macrophages) resembling xanthoma cells, with subsequent absorption changes.

AINHUM.

Synonym.—Dactylolysis spontanea.

Definition.—A disease characterized by the spontaneous amputation of one or more toes, usually the smallest, secondary to the formation of a constricting ring.

The affection was first described by Dr. Da Silva Lima, and has in the majority of instances been observed in the negroes of the West Coast of Africa, in Algiers, Egypt, South America, and exceptionally in negroes and the white race in our own country.

Symptoms.—The affection starts with the development of a furrow or shallow groove on the plantar surface of the toe or the palmar aspect of the finger. This furrow gradually deepens and spreads until a constricting and indurated ring is formed. The toe or finger beyond the point of constriction becomes swollen to two or three times its normal size, and after months or years

drops off. The amputation may occur at the first, second, or third joint, or even through the phalanx. There is usually very little pain. At times ulceration with a foul-smelling discharge develops, and in rare instances ulcers persist at the site of the disarticulation.

Trophic, vasomotor, and sensory changes of the affected part may be observed. The skin of the attacked portion, at times, is pigmented, wrinkled, puckered, the muscles wasted, the hair. growth increased, the tendon reflexes absent, and the sensibility lessened.

Etiology and Pathology.—The disease usually occurs in male subjects and adults of the negro race, exceptionally in childhood and the white race. The affection has been attributed to continued irritation by wounds of the foot, such as by sharp grass in those going barefooted, to jiggers, and to hereditary influences.

The constricting ring consists of fibrous tissue, with a thickened epidermis. The subcutaneous fat is usually increased. The bones are affected secondarily by the constriction.

Prognosis and Treatment.—The disease is progressive, generally terminating with the removal of the constricted member.

The toe or finger should be amputated surgically. The feet particularly and also the hands should be guarded against injury.

PERFORATING ULCER OF THE FOOT.

Synonym.—Malum perforans pedis.

Definition.—A disease characterized by callous formation and a subsequent ulcer or sinus, usually on the pantar surface of the foot, but occasionally on the hand.

Symptoms.—The epidermis in a circumscribed area becomes thickened and a hypertrophic border is formed, in the center of which develops a sinus or rounded ulcer, with a wall of unhealthy granulations. The ulcer usually penetrates deeply into the tissues and causes a disorganization of the underlying bone and, not infrequently, the metatarso-phalangeal joint. The discharge from the ulcer or sinus is very slight in most instances. The ulcer tends to develop at the point of greatest pressure, on the ball of the foot, posterior to the big toe, and occasionally on the heel or beneath the other metatarso-phalangeal joints. There is usually but one lesion present, which is frequently painless but exceptionally hypersensitive. Walking, however, is apt to cause pain. There may be anesthesia, neuralgic or rheumatic pains, and coldness of the affected part, and nutritional changes in the nails, or anidrosis, hyperidrosis, hyperpigmentation, and hyperkeratoses.

Etiology and Pathology.—The affection is a trophic disturbance with an added mechanical causation. It usually develops in adults

of the male sex. The outbreak has been found in association with tabes, leprosy, syphilis, and peripheral neuritis.

There is degeneration of the sensory nerves supplying the affected part and, in certain cases, calcareous and other degenerative changes in the arteries.

Diagnosis.—The affection should be easily distinguished from a corn, a localized callosity, or a tuberculous ulcer.

Prognosis and Treatment.—The condition tends to persist, and is extremely rebellious to treatment.

Therapeutic measures are frequently unsatisfactory and the lesion in most instances has to be treated surgically. Acid salicylic, 10 gr. (0.65); lead plaster and petrolatum, each ½ oz. (15.), may prove healing if the patient is kept in bed or off his feet. The surgical means are curettement, excision, and in severe instances amputation.

SYRINGOMYELIA.

Synonyms.—Morvan's disease; Myelosyringosis; Analgesic paralysis with whitlow.

Definition.—A disease of the spinal cord, characterized by sensory and trophic changes, chiefly of the upper extremity.

The affection was first described by Morvan in 1883.

Symptoms.—The disease begins with pain in the arm, then loss of muscular power, and later analgesia; although the latter symptom may be the first sign observed of the affection. Whitlows tend to develop singly or in crops; as many as nine have been observed at one time. They may appear more or less continuously, or months and years may elapse between the outbreak of these lesions. The fingers are the usual site of attack, exceptionally the toes are involved. The phalanges become necrosed and drop off, and the hand has a claw-like appearance. Various trophic and vasomotor disturbances are present, such as blueness of the skin, fissures, vesicles, bullæ, deep ulceration involving the tendon sheaths, changes in the substance of the nails, pigmented and glossy skin.

The other phenomena which may be noted are hyperidrosis, lessening or loss of the tendon reflexes, impaired vision, scoliosis, and arthropathies. Loss of muscular power is, at times, observed in the hand and arm because of atrophy of the muscles. The power of determining heat, cold, and pain are lost, but the sense of touch is intact. The upper extremity is usually alone attacked, and it may be limited to one arm; exceptionally, one or both legs show involvement, or both upper and lower extremities.

Etiology and Pathology.—The affection is rare and occurs usually in males between the ages of twenty and fifty years. The cause is

unknown, although some of the cases have been attributed to traumatism, malaria, syphilis, rheumatism, and other constitutional diseases.

The affection, pathologically, is apparently of central spinal origin. Cavities are found in the cerebral canal supposedly due to absorption of gliomata. Sclerotic changes have been found in the posterior horns and columns of the cord, and a sclerosis and neuritis of the peripheral nerves.

Diagnosis.—The affection has to be particularly differentiated from anesthetic leprosy, and unless the attack of syringomyelia is characteristic and the Bacillus lepra is found, extended observation may be required to determine which condition is present. Scleroderma and glossy fingers should be readily excluded.

Prognosis and Treatment.—The malady is insidious and frequently slow in progress, in certain instances, lasting over many years, at times, with prolonged remissions. Great deformity may result. There is a tendency for the disease to be progressive.

The disease should be treated symptomatically: Tonics, such as iron, quinine, strychnine, and arsenic are of use in raising the general tone of the individual. The lesions should be dressed with the official boric acid ointment, or ammoniated mercury 15 to 20 (1. to 1.3) gr. to the ounce (30.) of zinc oxide ointment. Galvanic and faradic currents have been applied to the spine.

CLASS 7.

NEW GROWTHS.

CICATRIX.

Synonym.—Scar.

Definition.—A scar is a new formation of the skin which replaces tissue loss.

Symptoms.—Cicatrices may be smooth, glossy, scaly, and in the beginning soft, reddish or pinkish, and later hard and white. They are elevated, even with the skin surface, or depressed, attached to the underlying structures, such as bone, or freely movable. Scars are linear, rounded, irregular in shape, with a corded, ridged or dotted surface. The most insignificant scars are seen as the result of clean and incised and punctured wounds. There may be considerable deformity of the skin by the contraction of certain cicatrices. The loss of tissue resulting from burns results in a corded scar. Those following the tertiary syphilitic lesions have a characteristic serpiginous outline. Those occurring about the joints may interfere with motion. They are usually painless but occasionally a nerve fiber is enmeshed in the fibrous tissue and pain results. Hypertrophic scars are usually the result of infected wounds or extensive loss of tissue in which there is prolonged granulation.

Etiology and Pathology.—Cicatrices are divided into traumatic, resulting from injury, and pathological, secondary to disease. The number of traumatic conditions and diseases which may give rise to scar formation are too numerous to mention. It is sufficient to state that any cause which destroys the papillary portion of the corium gives rise to a cicatrix.

A scar consists of connective-tissue bundles, irregularly arranged, with a very thin epidermic covering. The fibers are fine in young scars and later become coarse and contracted. In the early stage also the tissue is well vascularized, but afterward the vessels are obliterated. There is complete absence of the hair follicles, the glands, and the natural furrows of the skin. Most observers have found an entire absence of both papillæ and rete pegs in the scar.

Treatment.—Unsightly scars, if small, can in certain instances be excised with a betterment of the cosmetic appearance. For a softening affect salicylic acid, 10 gr. (0.65), and lead plaster and

petrolatum, each ½ oz. (15.), is efficacious. The roentgen-rays or radium softens and flattend certain cicatrices.

Fig. 75.—Hypertrophic scars from vitriol burn.

KELOID.

Synonyms.—Cheloid; Alibert's keloid; Kelis; Kelos.

Definition.—A keloid is a connective-tissue new formation, practically the same as a hypertrophic scar, usually following a trauma.

Symptoms.—Keloids correspond to excessive scars. They are usually very slow in growth, taking months or years to develop. These growths are of a pinkish-white, reddish or purple color, deeply seated in the corium, slightly or markedly elevated, hard, with rounded, flattened or uneven surface, and frequently with an irregular claw-like base. They vary from a fraction of an inch to many inches in diameter, and frequently involve large areas. Itching, tenderness, and even pain may be experienced. The

areas most frequently attacked are the sternum and the upper portion of the trunk, although any part of the cutaneous surface may show the anomaly. There may be but one, but usually several lesions are present.

Acne keloid is described under Dermatitis Papillaris Capillitii.

Etiology and Pathology.—Keloids are of frequent occurrence in the negro, while they are rather unusual in the white races. There seems to be either an individual idiosyncrasy or a family tendency toward their production in the white race. These growths may develop in both sexes and at any age. They may follow the most trivial trauma, such as insect bites, needle pricks, following various inflammatory diseases, or from severe injuries, blows, pressure,

FIG. 76.—Keloid in the negro. (Courtesy of Dr. Howard Fox.)

friction, and after suppurative processes. Instances have been reported in which keloids developed spontaneously (*spontaneous* or *true keloid*), supposedly without even a slight preceding trauma.

These growths consist of an overgrowth of fibrous connective tissue, arranged parallel to the skin surface, in the middle and lower portions of the corium.

Diagnosis.—A keloid is distinguished from a hypertrophic scar by its extending beyond the limits of the origin trauma.

Prognosis and Treatment.—The condition can be improved, made even with the skin surface, but not entirely eradicated.

Excellent results have been reported from the injection of from 10 to 20 minims (0.6 to 1.3) of a 10 per cent solution of thiosinamine

in equal parts of glycerin and water, or in alcohol. The roentgen-rays or radium is extremely effective in the treatment of these cases. As an adjunct the softening effect of salicylic acid, 10 gr. (0.65), and lead plaster and petrolatum, each ½ oz. (15.) is helpful.

FIBROMA.

Synonyms.—Fibroma mulluscum; von Recklinghausen's disease.

Definition.—Fibroma is a connective-tissue new growth characterized by the development of variously sized soft or firm tumors in the skin and underlying tissues.

FIG. 77.—Fibroma molluscum.

Symptoms.—The tumors exhibit a great variation in regard to size, elevation, shape, and consistency. There may be but the one new growth present, small or very large in size, at times pedunculated and exceptionally pendulous (*fibroma pendulum*). In the multiple cases there are only a few fibromata present or several hundred, varying from a pea to an egg and larger in size. Exceptionally a considerable portion of the cutaneous surface is densely packed with the lesions. The new growths may be rounded, pear- or sausage-shape, with a moderately narrowed base, pendulous, and in certain instances lobulated. Some of the fibromata are only slightly elevated above the skin surface and imbedded deeply in the subcutaneous tissue, while others are raised several inches.

The skin covering the tumors is generally normal in appearance, but it may be tense or lax, and of a pinkish or reddish color. The tumors are painless, usually soft, but occasionally of a firm consistency.

The new growths do not tend to undergo destructive changes but occasionally, particularly in the large tumors, there may be abrasion, ulceration, and at times inflammation, even, exceptionally gangrenous alteration. Partial absorption may occur in some of the growths and a soft mass of hanging, hypertrophied skin results (*acrochordon*).

Fibroma Molluscum.—A special form of fibroma has been described by von Recklinghausen to which various terms have been applied, such as *von Recklinghausen's disease, molluscum simplex, fibroma molluscum,* and *neurofibroma.*

Pigmented spots of small or very large size may develop months or years before the appearance of the fibromata, or may appear synchronously with the new growths, or again may be absent. Some authorities believe that all of the tumors are neurofibromata, a combination of nerve and fibrous tissues; while others consider that only a few of the lesions are other than fibrous new growths.

Any portion of the cutaneous surface may be the seat of fibromata. The back, however, is most prone to show the largest and most numerous lesions. Exceptionally the tumors have been found on the mucous membranes of the lips, the gums, the hard palate, and the tongue.

An unusual form of the affection has been described by Brickner, which develops from the fourth to the sixth month of pregnancy and disappears shortly after parturition. The growths were from ten to fifty in number, varied in size from a pin-head to a split pea, and were either pigmented or colorless.

Etiology and Pathology.—The condition is uncommon in our own country, but more frequent in England, on the Continent, particularly in the eastern countries. Several factors have been suggested as causal or associated with the condition; heredity or family tendency; weak physique or mental derangement; and traumatism. The affection may develop in early life, exceptionally congenitally, but reaches its full development only in later life. Single fibroma are observed in middle or late life.

Pathologically the growths consist of a circumscribed hyperplasia of connective tissue, chiefly of the fibrous type. In certain cases there is in addition a proliferation of the connective-tissue sheaths of the nerves.

Prognosis and Treatment.—The tumors do not tend to recur if excised but in extensive instances very little can be done in their elimination. Electrolysis may be used in the removal of the small

growths. Arsenic may be administered without much hope of success.

Dermoid Cysts.—They are generally single; those of the multiple variety are very rare. They are indistinguishable clinically from fibroma. Histological examination or incision of the growth alone proves the diagnosis.

PARAFFIN PROSTHESIS.

Those individuals who have had paraffin injected into the skin and subcutaneous tissues for the removal of wrinkles and various deformities or abnormalities are subject, in certain cases at least, to the formation of deforming new growths. Six months to two or three years after the paraffin, having been melted to 40° C., or a higher temperature, is injected the deformity commences. These changes are observed at the sites of injection, at the junction of the nose with the cheeks, between and beneath the eyes, in front of and below the ears, and on the neck. The masses are firm in consistency, attached to the epidermis, deeply imbedded in the subcutaneous tissues, and vary from a pea to a hen's egg and larger in size. They are of a bluish-red or brownish-red color, often showing a line of the yellowish-white paraffin in the center, at times covered with dilated bloodvessels, and resemble somewhat keloid. Subjective symptoms are usually mild or absent.

Swelling and edema are so marked, in certain instances, that the eyes are almost entirely closed and the face double its normal size. Infections of the oral and nasal cavities seem to predispose to the deformity.

Histopathology.—The tumors are connective-tissue new growths resembling the granulomata. Numerous round and oval cavities, some of large size, are found in the tissues—spaces formerly occupied by the paraffin. Fibrous bands, giant cells, connective-tissue cells, and numerous enlarged bloodvessels are also present.

Diagnosis.—The masses are readily differentiated from keloid and lupus vulgaris by the hardness of the growth, the absence of the soft yellowish-brown nodules of lupus, and by the history, color, size, and the location.

Prognosis and Treatment.—Although scars usually result the condition can be much improved by excision, roentgen-ray exposures, or the combination of the two. The roentgen-ray flattens, decreases the size, and softens the growths. Rupture of the growths is apt to occur by this means and the hard paraffin is then thrown out and healing slowly results. The patient usually refuses excision as there may have been from six to twelve areas injected.

CHONDRO-DERMATITIS NODULARIS CHRONICA HELICIS.

A small, nodular, painful growth which develops on the rim of the ear. These lesions appear suddenly, without a history of previous injury, and are single, well-defined, reddish nodules, varying from 3 to 4 mm. in their diameter. They are imbedded in the skin and usually attached to the underlying cartilage. The growth has a flat top, with a sloping margin, and a central depression covered with an adherent scale. The little tumors do not tend to increase in size after reaching a certain development and remain unchanged indefinitely. Malignant changes do not occur.

Foerster found on section a diffuse inflammatory and degenerative process of the corium, associated with considerable epithelial hypertrophy.

Treatment.—Treatment has consisted of the galvanocautery, electrolysis, carbon dioxide snow and radium.

LIPOMA.

Synonyms.—Fatty tumor.

Definition.—A new growth consisting of fatty tissue and seated in the corium and subcutaneous tissue.

Symptoms.—These tumors occur as circumscribed or diffuse growths, varying from a pea to a plum or larger in size, smooth, lobular, soft in consistency, and in rare instances pedunculated. The skin over the lipomata is usually freely movable, excepting for inflammatory adhesion, and the growths are also easily moved. The skin covering the fatty tumors is usually normal in appearance but occasionally is pigmented. In most instances there are several lesions present; at times, however, only one; and exceptionally the tumors are numerous. The neck, the back, and the buttocks are the sites most often attacked. The diffuse form of the affection shows ill-defined fatty swellings which may involve large areas.

Fatty somewhat nodular tumors of large size may occur on the neck and the condition has been termed "fatty neck."

Circumscribed lipomata exceptionally disappear as the result of ulceration or inflammation, but in only rare instances do they undergo malignant change. There are no subjective symptoms. The growths may undergo calcareous, myxomatous, or colloid changes, and occasionally there is an increase in the vascular tissues (*lipoma telangiecticum*).

Etiology and Pathology.—The cause of the affection is unknown. The tumors are usually observed in middle or late life, but in rare instances they have been congenital. Women are apt to be attacked by the circumscribed form while men more frequently show the diffuse type.

The new growths are composed of groups of large fat cells, held together by a capillary net-work, forming small lobules. The tumors are enclosed within a connective-tissue capsule.

Diagnosis.—The growths are diagnosed from other conditions by their movable, lobulated, non-compressible, soft, slow-growing and painless character.

Prognosis and Treatment.—The tumors are benign and after reaching a certain size tend to remain stationary.

Extirpation is the only cure.

ADIPOSIS DOLOROSA.

Synonym.—Dercum's disease.

Symptoms.—The disease is characterized by the gradual development of irregularly symmetrical deposits of fatty masses in various portions of the body, preceded or accompanied by pain of a neuralgic character. The deposits of fat are often large in size and soft in consistency. The hands, the feet, and the face are not attacked by the growths. The skin is apt to be dry and in certain instances a purpuric outbreak and hemorrhages from the mucous membranes have been observed.

There may be an associated muscular weakness, with flabby and degenerative changes in the muscles, nerve tenderness, alteration in the tactile and temperature senses, gastric and uterine hemorrhages.

Etiology.—The cause of the affection is unknown. The disease tends to attack women of middle age.

Diagnosis.—It is differentiated from myxedema by the inconstancy of alterations in the thyroid gland.

Treatment.—Treatment consists of the administration of the extract of the thyroid gland, potassium iodide, and the local application of the roentgen-rays.

NEUROMA.

Synonyms.—Neurofibroma; Nerve tumor.

Definition.—A new growth consisting of one or more tubercles in the skin, which are composed of elastic, fibrous, and connective tissue, and also nerve fibers.

Symptoms.—The nodules or tubercles are disseminated, defined at times, closely packed together, pin-head to hazel-nut in size, immovable, elastic, dense, purplish or pinkish in color, tender, painful, spherical, or oval in shape. The outbreak tends to attack the shoulders, the arms, the thighs, and the buttocks. Although they may develop without pain, they are eventually accompanied

by excruciating paroxysmal pain. The latter is aggravated by temperature changes, mental emotion, and movement. The skin between the nodules is normal or slightly scaly.

Etiology and Pathology.—Neuroma is rare, usually developing in adults, more often of the male sex. The cause is unknown, although traumatism, irritation, a family tendency, and tuberculosis have been suggested as predisposing.

Histologically, the growth is composed of firm connective tissue containing medullated or non-medullated nerve fibers, bloodvessels, and lymphoid cells.

Diagnosis.—A microscopical examination is at times necessary to differentiate the affection from myoma.

Prognosis and Treatment.—Treatment consists of excision of the lesions or in extensive cases resection of the plexus or the nerves supplying the affected part. The pain is apt to recur notwithstanding extensive resections.

MYOMA.

Synonyms.—Dermatomyoma; Leiomyoma; Muscle tumor.

Definition.—Myoma is a tumor composed of smooth muscle fibers mixed with fibrous tissue.

Besnier has divided this class of new growths into two classes: simple myoma or leiomyoma, and dartoic myoma.

Multiple Myomata (*Simple Myoma*) are of rare occurrence and characterized by the development of superficial, multiple, pin-head- to pea-sized or larger, soft, elastic, reddish or brownish or rarely translucent yellow tumors, from which the color can be temporarily pressed. The lesions tend to develop slowly, new lesions continuing to appear while the old ones persist and increase in size. There are usually but a few growths present; exceptionally they are numerous, and there is a tendency to form groups. The face, the neck, and the trunk are most frequently attacked. The lesions may be painless or painful. The pain if present is apt to develop after the lesions are fully formed; it is spontaneous, paroxysmal, at times severe, and excited by pressure and exposure to heat and cold.

Dartoic or Deep-seated Myoma is of more frequent occurrence than simple myoma. There is usually but the one lesion present, occasionally several, and the mammæ, the labia majora, the penis, and the scrotum are the areas most often attacked. The tumor grows slowly, eventually becoming the size of an orange and may be pedunculated. The growth tends to contract under the stimulus of cold and local irritation. It is usually painless but may be slightly painful.

Etiology and Pathology.—The growths tend to develop in the adult female, exceptionally, however, they appear in childhood. Their etiology is unknown.

The multiple forms (*simple myoma*) consist of unstriped muscle fibers, surroundid by elastic tissue, and originate from the arrectores pilorum or from the fibers of the middle coat of the bloodvessels.

The *dartoic* or *deep-seated myoma* rises from the tunica dartos or from the embryonic remnants in the skin.

There may be a considerable admixture of fibrous tissue with the muscular fibers in the tumor (*fibromyoma*); an increased number of bloodvessels (*angiomyoma*); or of lymphatics (*lymphangiomyoma*).

Diagnosis.—A microscopical examination may be necessary to establish the diagnosis.

Prognosis and Treatment.—Extirpation is indicated if the lesions are not too numerous. In exceptional instances pain has persisted after the removal of the growths.

OSTEOMA CUTIS.

Synonyms.—Osteosis cutis; Bony tumor.

Symptoms.—The affection is rare and is characterized by the development of single or multiple new growths composed of bone. Osseous formation has been found on the plantar surface of the foot (Coleman); on the scalp (Salzer); in a scar following a laparotomy operation (F. G. Harris); on the limbs, the scalp and the trunk of a child (Taylor and MacKenna); and in a pigmented nævus (Heidingsfeld). Misplaced embryonal cells and also trauma have been cited as causal.

Treatment consists of excision.

NÆVUS PIGMENTOSUS.

Synonym.—Pigmentary mole.

Definition. Pigmented nævi are congenital circumscribed lesions characterized by an increased deposit of pigment, and, at times, hypertrophy of the other cutaneous structures.

Symptoms.—Moles vary in color from a light yellow or chocolate-brown to a blackish hue, and are from pin-head to the palm of the hand and larger in size, of an ovoid, circular, or irregular contour, even with the skin surface or considerably elevated, with a smooth or wart-like surface, and frequently covered by hairs. Some bear a rough resemblance to the conformation of certain animals; hence the popular theory of maternal impression. The areas usually attacked are the face, the neck, the trunk, the thighs, the buttocks, and the external genitalia.

Moles are divided according to the predominance of certain structures of the skin into *nævus spilus, nævus verrucosus, nævus pilosus,* and *nævus lipomatodes.*

Nævus spilus is the term applied to a smooth, non-elevated or slightly raised pigmented spot.

Nævus verrucosus is applicable to a raised pigmented wart-like area, frequently containing hair.

Nævus pilosus is the term applied to a pigmented mole containing short or long, stiff or downy hair.

FIG. 78.—Pigmented nævus. Hairs were removed by the roentgen-rays and the color by carbon dioxide snow. Patient, aged twenty-one years.

Nævus lipomatodes is the type characterized by an excess of fat and connective-tissue hypertrophy, in addition to the pigmentation.

Exceptionally a curious unilateral and linear arrangement of nævi may be found following more or less accurately the distribution of a cutaneous nerve. Several terms have been applied to this band-like form of the disease (*linear nævus, nævus unius lateralis, nævus nervosus,* and several others).

Etiology and Pathology. Moles are of congenital origin, in most instances, at least. They usually first appear a few weeks after birth. In those appearing in the adult, probably an embryonal defect has slowly developed into the visible mole formation. The linear arrangement seen in certain cases has been thought to be

etiologically associated with the underlying structures, such as the nerves and vessels.

Pigmentary moles show an increased amount of pigment in the deeper layers of the rete cells and a deformity of the rete pegs. Nævus cells are also found in the corium. Warty and hairy moles exhibit peculiar embryonic cells, arranged in rows in the corium. It has not been definitely determined whether these nævus cells are epithelial or endothelial derivatives. There has been a great

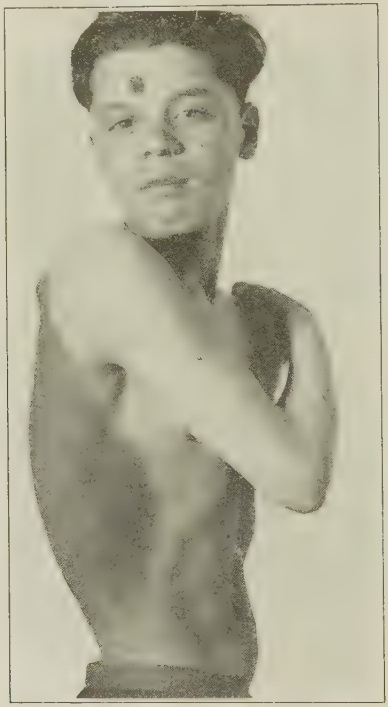


Fig. 79.—Nævus pigmentosus.

diversity of findings in the linear nævus cases; a diminution in the glandular organs of the skin in some, and in others an enlargement of the papillæ, bloodvessels, and prickle cells.

Prognosis.—After reaching a certain size a nævus tends to remain stationary. Those in early life tend to grow in size for some months or years, and may change from a smooth to a warty or hairy nævus. Moles, particularly if irritated, may undergo malignant change.

Treatment.—The treatment of pigmented moles depends considerably upon their size, elevation, character of the surface, and whether they contain hairs or are of a fatty consistency.

The small non-elevated or slightly raised non-hairy moles occurring about the face may be treated by salicylic acid, 1 dr. (4.) to the ounce (30.) of flexible collodion, trichloracetic acid, or by carbon dioxide snow; the latter is preferred in most cases. The salicylic acid collodion preparation is applied once each week. Trichloracetic acid is applied with a pointed match-stick, tooth-pick, or pointed applicator until the surface is whitened. Several applications are usually necessary to effect the desired result, and a persistent slightly reddened area may remain. The technic of the "snow" treatment has been described.

Non-hairy considerably raised moles of small size are preferably treated by the electric needle; either one or two needle electrodes are introduced parallel to the skin surface into the growth. This procedure is repeated until the tumor changes color, showing that destruction has occurred.

Verrucous moles are best treated, if of small size, by carbon dioxide, or, if large, by the roentgen-rays or radium.

Hairy moles are either depilated by the electric needle or roentgen-ray exposures, and, if small, are then exposed to the snow method, or, if large, the roentgen seances are continued.

Large infiltrated and fatty moles respond best to roentgen-ray exposures, although betterment alone can be expected.

Moles of a blackish color which show any tendency to malignant change should be thoroughly excised.

NÆVUS VASCULARIS.

Synonyms.—Nævus vasculosus; Angioma; Nævus sanguineus; Mother's mark; Birthmark.

Definition.—A congenital new growth, consisting of hypertrophy of the vascular tissues of the corium and subcutaneous tissues.

Nævi may be divided into three varieties:

Flat, non-elevated or slightly raised nævi, composed of a superficial plexus of dilated capillaries; which type has been termed *port-wine mark, nævus angiectodes, nævus flammeus.*

Hypertrophic or elevated angiomata made up of a network of large dilated bloodvessels (Angioma simplex hyperplasticum of Virchow; Angioma plexiforme of Winiwater; Angioma glomeruliforme of Unna).

Angioma cavernosum (Winiwater) is a cavernous nævus which tends to destroy the surrounding tissues by mechanical obstruction.

Symptoms.—The superficial flat nævi vary from a bright red to a dark purple color, depending upon the arterial or venous involvement. The color can be temporarily pressed from the superficial red nævus. They are non-elevated or slightly raised.

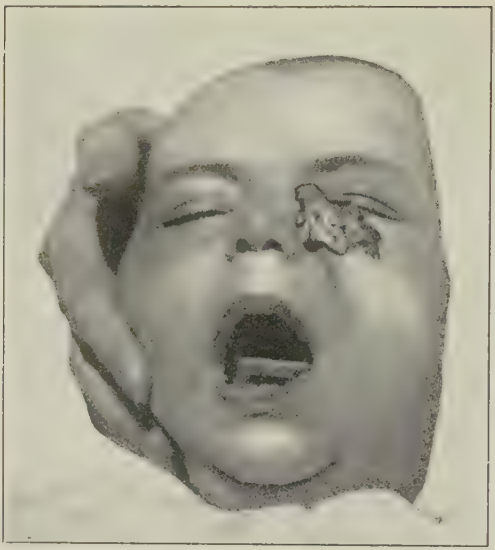


FIG. 80.—Nævus vascularis. Infant, aged four months. Treated successfully with carbon dioxide snow.

FIG. 81.—Extensive vascular nævus. Was observed five days after birth and extended rapidly. The nasal septum and right ala nasi have been destroyed. Infant, aged six months.

The skin covering the growths may be smooth, slightly roughened, or thick and warty. They vary from the size of a coin to the involvement of extensive areas. One or more lesions, either grouped or disseminated, are observed. Their most frequent site is just below the occiput and next in point of frequency upon the face. The border of the vascular growth is sharply outlined, although there may be outlying patches. If several groups of lesions are present they tend to have a unilateral distribution.

Hypertrophic nævi have the same characteristics as the flat or superficial variety but are of larger size and the bloodvessels are more numerous and of larger caliber. They may be considerably elevated, lobulated, and, in certain instances, nodular. The growths vary in size from a pea to a walnut and may involve the entire side of the head and neck, or the greater portion of an extremity. The large tumors located over a bony projection often exhibit pulsation. Coughing or crying, by impeding the circulation, causes temporary congestion of the lesions. This form of nævus most often attacks the face or neck. The large lesions sometimes ulcerate because of mechanical interference with the circulation, and alarming hemorrhage occurs. There is usually an absence of subjective symptoms in these two varieties of nævi.

Cavernous nævus (Angioma cavernosum of Winiwater) is a persistent slow-growing vascular, globular, or lobulated tumor of a purplish color, deeply seated in the tissues. These growths may, after a certain period, remain stationary, but are apt to progress and destroy the contiguous tissues, even cartilage and bone. They cause destruction by mechanically shutting off the blood supply and are often accompanied by severe pain.

Etiology.—*Flat* or *hypertrophic nævi* may be observed at birth or from a few to several weeks later. Nævi are a development defect, but their causation is unknown. Various factors have been suggested as causal, such as maternal impressions, a theory chiefly of the laity, and intra-uterine pressure, exploited by Unna and Virchow. Statistics, according to Gessler, show that vascular nævi are found twice as often in females as in males.

Cavernous nævi appear during the first year of life and a history of previous injury is frequently ascertainable.

Pathology.—The growth consists of dilated and newly formed bloodvessels in the papillary layer of the corium and, at times, in the whole derma and subcutaneous tissue. The vessels, either arteries or veins, may be slightly or markedly dilated, in extreme instances showing pouch-like or cavernous distentions and sinuses. The connective tissue chiefly surrounding the bloodvessels is slightly or considerably increased. All of the tissues of the skin may share in the hypertrophy. In the cavernous variety, according

to Winiwater, the structure resembles closely the cavernous tissue of the penis.

Diagnosis.—Vascular nævus should be readily distinguished from other affections, as it is present at birth or appears shortly afterward. Hematoma is easily differentiated by its different course and characteristics.

Prognosis.—Vascular nævi are usually permanent, although occasionally they disappear spontaneously. They tend to increase more or less rapidly in size for several weeks or months after their appearance and then slowly progress or remain stationary. Exceptionally dangerous hemorrhage occurs from ulceration of the growth, and rarely there has been a fatal result. Superficial ulceration of the tumor may cause spontaneous cure. Very little can be accomplished in extensive port-wine marks or in very large growths.

Treatment.—Vascular nævi may be treated by flexible collodion, trichloracetic acid, the electric needle, carbon dioxide snow, liquid air, radium, the roentgen-ray, and excision. Flexible collodion by its contracting properties may decrease the size or cause the disappearance of a small superficial flat nævus. Trichloracetic acid is applied to the same type of lesion until the surface is whitened, or several small incisions may be made along the course of the large bloodvessels of the growths and the acid applied in the linear cuts; several applications, in selected cases, help or eradicate the condition. Flat nævi can be also beneficially treated with the electric needle. The needle is attached to the negative pole and a current 2 to 5 ma., or 5 to 10 ma. for the hypertrophic variety, is used. The needle is inserted into the corium and withdrawn when a linear blanching of the surface is observed; this is repeated several times and in several directions into the tumor. A needle dipped into nitric or carbolic acid may be used in place of the electric needle. The electric needle should be used with care in the raised lesions, as there is the possibility of a thrombus being formed.

There is no better method, in a considerable number of nævus cases, than the use of carbon dioxide snow, applied with moderate or considerable pressure for from ten to thirty seconds. Radium and fulguration are suggested in the treatment of the port-wine marks. Surgical means such as hot-water injections, excision, ligation, or the roentgen-rays are to be considered in the extremely elevated cases or in cavernous nævi.

NÆVUS ANEMICUS.

A type of congenital nævus which is characterized by vitiligo-like areas, occurring singly or in groups, and which differ from normal skin only in vascularity. The outbreak exhibits rounded or irregu-

larly shaped, sharply marginated areas. Friction, heat or cold cause the areas to stand out more distinctly. The condition is readily distinguished from vitiligo because there is no lack of pigmentation in the affected area.

NÆVUS FOLLICULARIS KERATOSIS.

C. J. White has described a circumscribed deformity of the skin which is characterized by dilatation and infiltration of the follicles which were widely dilated, crateriform and sieve-like in appearance. The right thoracic region, anteriorly and posteriorly, was involved. There were no subjective symptoms.

FOLLICULITIS ULERYTHEMATOSA RETICULATA.

A chronic condition of the skin described by MacKee and Paronagian, limited to and symmetrically involving the cheeks, and developing in childhood.

The eruption consisted of numerous closely crowded, atrophic areas separated by narrow ridges, producing a reticulated, honeycombed, or network appearance. The pit-like areas were 1 mm. in depth and from $\frac{1}{4}$ to 3 sq. mm. in area. A few comedones and milium bodies were observed in the depressed areas or on the ridges.

The cause of the disease is unknown. It resembles histologically but not clinically White's "Nævus Follicularis Keratosis."

TELANGIECTASIS.

Definition.—An acquired dilatation of the capillaries in the skin.

Symptoms.—Tortuous or wavy red lines, either minute or plainly discernible, are observed which consist of dilated or newly formed capillaries. They vary from $\frac{1}{8}$ to $\frac{1}{4}$ inch in length, sometimes branching or crowded closely together. The color can be temporarily pressed from some of the lesions. There may be but a few or many of these dilated vessels, even to the production of a mottling of the skin. There may be a central red dot with radiating dilated capillaries, constituting the so-called *spider nævus* (*nævus araneus*). These areas are most often observed upon the face in the neighborhood of the nose and cheeks. They also have been noted on the outer surface of the thighs, on the abdomen at the lower border of the ribs, and over the shoulders. Exceptionally the telangiectases are quite numerous and more or less general in distribution. Rarely vascular tumor-like growths may supervene.

Papillary varices involve the capillary loops of several contiguous papillæ and are characterized by the appearance of small pin-head-

to pea-sized, purplish-red, flattened or rounded, hard or soft elevations. These occur on the trunk, particularly the upper portion.

Varicose veins (*Angioma venosum racemosum of Virchow*) are another well-known and common example of dilated bloodvessels found on the lower portion of the leg. The congestion of the affected part caused by the blood stasis renders the leg liable to attacks of eczema and ulcers.

Etiology and Pathology.—The primary causal factors of the affection are an out-of-door life, particularly in those of a florid type; old age, heredity, and individual tendency. The *spider mark* may be congenital. Under such circumstances it is classed as a *vascular nævus;* when acquired, it is termed a *telangiectasis.* It is usually found in infants and children, exceptionally in adults. Telangiectases are observed following or associated with morphea, tuberculosis, syphilis and malignant infiltrations of the skin, with myxedema, rosacea, xeroderma pigmentosum, and in senile skin. They are frequently seen in a marked degree secondary to a roentgen-ray dermatitis. Papillary varices are observed in middle-aged or elderly individuals. Varicose veins are noted in those required to stand for long periods, in middle and advanced life, particularly in women who have borne children.

The microscopical picture shows simply a dilatation of the capillaries.

Treatment.—If the color can be temporarily removed from the telangiectasis by pressure, there is simply a congestion of the capillary, and internal treatment toward some gastro-intestinal condition is indicated. Generally, however, the little bloodvessel is permanently dilated and destruction is indicated. The electric needle is the best means to employ. The needle attached to the negative pole is inserted into the capillary, using a current of from 2 to 4 ma. until blanching occurs. In place of the electric needle the vessel may be carefully slit with a sharp knife and trichloracetic acid applied. In treating so-called spider marks it usually suffices to insert the electric needle into the central red dot until it is whitened. Trichloracetic acid may be used in the same way. The physician is rarely called upon to treat papillary varices; if so, the electric needle or trichloracetic methods may be employed.

The treatment of varicose veins belongs chiefly to the domain of surgery. The patient should be kept off of the leg as much as possible. An elastic web bandage should invariably be worn, excepting when the afflicted individual retires at night.

ANGIOMA SERPIGINOSUM.

Synonyms.—Infective angioma, or nævus lupus (Hutchinson); Sarcome angioplasique réticulé (Darier).

Definition.—A rare affection resembling very superficial nævi but spreading peripherally.

Symptoms.—The disease consists of small bright red, at times purplish, vascular points resembling grains of cayenne pepper, forming small groups which spread peripherally and tend to clear in the center. Rings are thus formed with a diameter not exceeding a half inch. Fresh lesions continue to develop a little beyond the border of the spreading patch ("infective satellites," as termed by Hutchinson), and by their joining with other rings large gyrate areas are produced. Scattered reddish dots and linearly arranged lesions are seen beyond the main areas of disease. The intervening skin is usually of a pinkish color. The dots vary from the size of a pin-head to those scarcely discernible. The ring and group formations may exceptionally be absent. The affection is usually observed on the arms or legs; in certain cases, however, the trunk or face have been attacked. The disease tends to be progressive and spreads very slowly. There may be certain periods without spread, and regression then ensues. There is usually no atrophy or scarring.

Etiology.—In most instances the affection has first appeared in early life, under the age of two years. It has followed vascular strain, heart disease, convulsions connected with dentition, and also in the vicinity of preëxisting nævi.

Pathology.—The affection resembles a superficial nævus.

Treatment.—Therapeutic measures have had no effect on the course of the affection. Electrolysis may be tried.

MOLLUSCUM CONTAGIOSUM.

Synonyms.—Molluscum epitheliale; Molluscum sebaceum; Epithelioma molluscum; Epithelioma contagiosum.

Definition.—A disease of the skin characterized by the development of small, waxy, pearl-like tumors with a central depression.

Symptoms.—Minute yellowish or pinkish-white, somewhat shiny elevations develop, which become pin-head to pea in size, but, in certain instances, large pedunculated growths. They are rounded, semi-globular, or have a flattened surface, with a central umbilication, and resemble somewhat pearl buttons. They are generally firm in consistency, at times soft, and a semi-solid, cheese-like material can be pressed from the central opening. Some of the lesions may undergo inflammatory changes, become reddened, suppurate, break down, and heal without leaving a trace. They tend, however, in most instances to run a chronic course and persist more or less indefinitely. Some of the tumors dry up and disappear without any signs of inflammation. New lesions appear from time

to time. There are usually but a few growths present, generally not more than six to twelve. They tend to remain discrete, but occasionally may form small or large groups. The tumors are most frequently found on the face, in the neighborhood of or on the eyelids. The trunk, the extremities, the genitalia and the scalp occasionally have shown the lesions. In a recent severe epidemic, observed by the writer, many individuals showed hundreds of lesions limited to the trunk. There are usually no subjective or constitutional symptoms; occasionally, however, in extensive cases involving the trunk, particularly when a considerable number of the growths are inflamed, there is intense itching.

FIG. 82.—Molluscum contagiosum. Boy, aged three years; duration some months.

Etiology.—There seems to be no doubt of the contagiousness of the affection, as large epidemics have occurred in schools, colleges, institutions, in bathing establishments, etc. I have seen 59 cases in a children's home and over 200 students were attacked in a certain university. The disease has been experimentally produced. The incubation period of the affection is from three to six months. Although several organisms have been discovered, none have been proved as causal. The disease is usually observed in children; either sex is attacked. The tumors have also been found in chickens, sparrows, pigeons, etc.

Pathology.—The molluscum bodies which were originally believed to be psorosperms have been demonstrated to be degenerated epithelial cells.

The lesions were thought to be tumors of the sebaceous glands, but most authorities believe them of epithelial origin and independent of these glands. They are derived either from the epithelium of the hair follicles or from the rete layer of the epidermis. These bodies can be readily examined by collecting on a slide the secretion pressed from the summit opening of the growth.

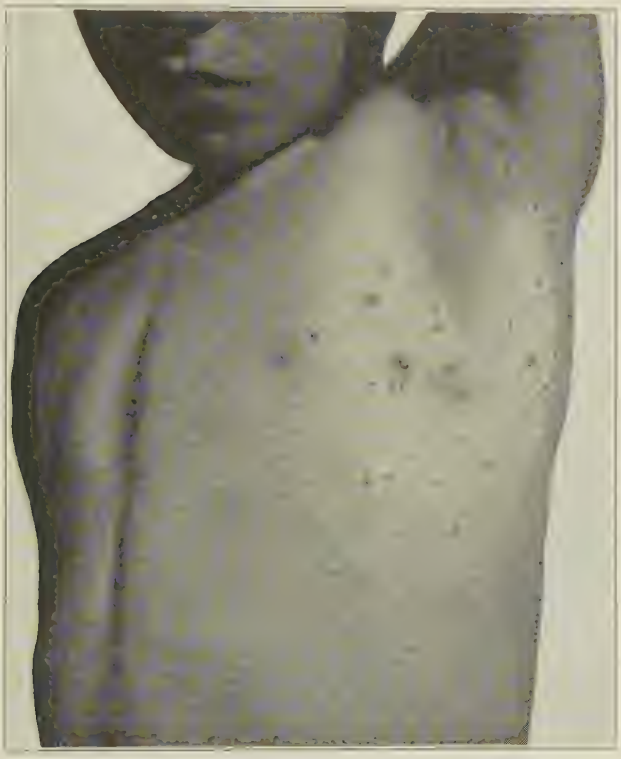


FIG. 83.—Molluscum contagiosum. Boy, aged ten years.

The lesions are lobulated epithelial tumors surrounded by a fibrous capsule which sends fibrous bands into the growth, dividing it into lobules. These lobules are made up of cells which become white, opaque; their internal structure is obliterated, and by their increase in size large, round, so-called molluscum bodies are formed. These cells tend to break down, and the neck of the tumor contains a yellowish, cheesy disorganized mass.

Diagnosis.—The small pearl-like umbilicated growths from which a cheesy mass can be expressed should clearly differentiate this

condition. Large pedunculated growths are the exception, and usually the associated common form assists in its diagnosis.

Prognosis and Treatment.—The prognosis is favorable, as the lesions are, in most instances, readily eradicated.

The usual type of lesion is easily removed by the application of trichloracetic acid or the electric needle. A pointed applicator wet with the acid is bored into the central opening until it turns white and the surrounding portion of the growth is also whitened by the same application. The needle attached to the negative pole is inserted into the growth parallel to the skin surface, using a

FIG. 84.—Molluscum contagiosum.

current of 2 to 5 ma., until the lesion becomes a dirty yellowish-gray color. Large tumors should be excised, or the electric needle, using a stronger current, is employed. Extensive cases exhibiting a large number of lesions involving the trunk yield frequently to a solution of formalin, 1 to 2 dr. (4. to 8.) to 1 pint (480.) of water, mopped on freely, once or twice daily.

XANTHOMA.

Synonyms.—Xanthelasma (Wilson); Vitiligoidea (Addison and Gull); Fibroma lipomatodes (Virchow); Plaques jaunâtres des paupières (Rayer); Molluscum; Cholésterique (Bazin).

Definition.—A disease of the skin characterized by the formation of yellowish plaques or nodules. The disease is divided into two clinical varieties, *xanthoma planum* (*xanthelasma*), the common type, and *xanthoma tuberosum* or *xanthoma multiplex*, which is unusual.

Symptoms.—**Xanthoma Planum** (**Xanthelasma**). This form of the affection exhibits one or more small or large, rounded or linear, sharply defined, non-elevated or slightly raised, smooth, soft and compressible, opaque yellowish patches resembling chamois leather. The plaques when examined closely, particularly if the skin is

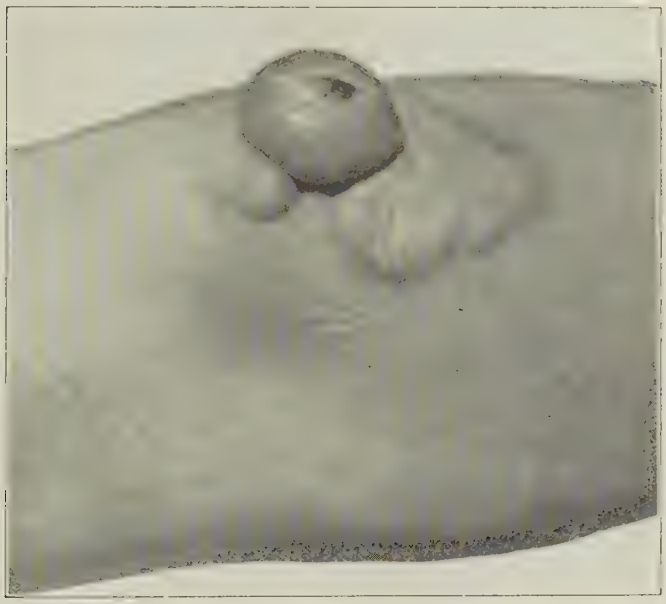


FIG. 85.—Xanthoma tuberosum multiplex.

stretched, are orange-yellow, at times with a minute pinkish or reddish central point. The skin over the patch is of normal texture. Exceptionally the patches are of a whitish-cream shade or even a deep brown hue. The plaques are usually observed on the eyelids, chiefly the upper, and unilaterally or symmetrically distributed. They grow slowly, and years may elapse before full development is completed. If other portions of the face or the mucous membranes of the mouth are involved, in each instance the nodular or mixed types are present. There are, as a rule, no subjective symptoms, but occasionally slight itching or burning is present.

Xanthoma Tuberosum or Xanthoma Multiplex.—The lesions are nodular instead of flat, varying from a pin-head to a hazel-nut, and at times an orange or larger in size. They are either soft or of a firm consistency, yellowish or orange in color, and frequently show dilated bloodvessels upon their surface. The lesions are usually formed by coalescence of the smaller growths. There are frequently large numbers of lesions present, and they may be widely distributed. The hands, palms, feet, soles, ankles, and the buttocks are most often attacked. Lesions may develop on the

FIG. 86.—Xanthoma tuberosum multiplex. Same case as Fig. 85.

lips, in the mouth, in the iris, and on the conjunctiva. Various viscera, such as the heart and abdominal organs, are at times attacked. In a case under my observation, tumors were present in the tendo Achillis and over the knuckles, as well as in the usual locations. Xanthoma planum plaques on the eyelids may be associated with the tuberous variety. The lesions develop, generally, more rapidly than in the planum type. Subjective symptoms are usually absent. Occasionally, however, there is slight itching and burning.

Xanthoma Elasticum, or Xanthoma Pseudo-elasticum, is a closely allied affection described by Balzar. The lesions were pin-head- to pea-sized, flat, yellowish in color, and occurred over the flexor folds, about the umbilicus, the clavicles, and the extremities; the eyelids were normal. Hepatic and diabetic symptoms were absent, but tuberculosis has been present at times. The process is considered to be due to a degeneration of elastic tissue. Xanthoma and fat cells were not found.

Etiology.—*Xanthoma planum* is a disease of adult life and more frequently occurs in women. Heredity, migraine, jaundice, gout, rheumatism, and utero-ovarian conditions have been attributed as causal.

Xanthoma multiplex is of unusual occurrence, attacking both sexes and children as well as adults. Heredity has been mentioned as causal. Jaundice frequently precedes or accompanies the disease. Various organic diseases are not infrequently present.

Pathology.—Pollitzer believes that xanthoma planum (*xanthelasma*) is due to a fatty degeneration of the orbicularis muscle, the xanthoma bodies being fragments of degenerated muscle fibers.

Xanthoma tuberosum multiplex is a connective-tissue growth containing cells infiltrated with fat. Cells of various size, having a distinct membrane, granular protoplasm and large round or oval nuclei, from one to a dozen or more, are found between the interlacing fibers, and are termed "xanthoma bodies." Some authorities consider the primary process is an inflammation which is followed by a fatty degeneration of the cells. Pollitzer and Wile believe that the tuberous type of xanthoma represents an irritative connective-tissue hyperplasia, in which the extravasation of cholesterol fatty-acid ester, present in excess in the blood, serves as the stimulus.

Diagnosis.—The characteristic color, location, and form of the lesions should readily distinguish it from miliary and multiple dermoid cysts. Xanthoma diabeticorum is differentiated under that affection.

Prognosis.—The affection does not tend to spontaneous disappearance, but after reaching a certain growth remains stationary. Xanthoma involving the internal organs may prove fatal.

Treatment.—The best treatment for xanthoma planum (*xanthelasma*) attacking the eyelids is trichloracetic acid. This acid is lightly applied to the stretched surface until the chamois-like patch becomes white and is then neutralized with alcohol. The electric needle attached to the negative pole and inserted parallel to the surface, using 2 or 3 ma., has also proved successful. "Snow" has also been used.

In the multiplex cases the lesions of large size should be excised.

XANTHOMA DIABETICORUM.

Synonym.—Glycosuric xanthoma.

Definition.—A rare affection usually associated with diabetes and characterized by the development of papules, or nodules, with reddish bases and yellowish summits.

Symptoms.—The outbreak may appear gradually or rather rapidly. The lesions are usually in the beginning of a dull red color, but shortly most of them develop minute yellowish summits which tend to spread to the elimination of a considerable portion of the inflammatory base. They are firm or hard, rounded or conical sharply defined pin-head- to pea-sized papules, mostly discrete but at times crowded together into a patch. New lesions may continue to appear, while some of those already formed disappear. Some of the lesions may show a predominance of the yellow color, and because of their flatness resemble ordinary xanthoma. Although a considerable portion of the cutaneous surface may be involved, the disease tends to attack the buttocks, the extensor surface of the forearms, the elbows, the knees, and the back. The scalp, lips, mouth, and face have also shown involvement. There are usually but a comparatively few lesions present. Itching and burning may be absent, slight, or severe.

Etiology.—In most cases diabetes or glycosuria has been present and at times the quantity of sugar present determines the extent and severity of the outbreak. The male sex, between the ages of twenty-five and fifty years, occasionally at an earlier period, is attacked. Pentosuria, albuminuria, and jaundice have also been found. It is an undecided question whether xanthoma diabeticorum is a form of xanthoma multiplex or a separate entity.

The lesions are anatomically similar to those in the latter disease, excepting that there is more inflammation and less connective tissue.

Diagnosis. The affection is distinguished from xanthoma multiplex by the rapidity of onset, the tendency to involute, tenderness, itching, and the reddish color of the lesions, and the presence, in most instances, of glycosuria.

Prognosis and Treatment.—The eruption tends to disappear spontaneously; the disappearance is hastened by the betterment of the diabetes.

Treatment is based on the principles followed in diabetes. If there is much pruritus, menthol, 2 gr. (0.12) to the ounce (30.) of zinc oxide ointment, or a saturated solution of boric acid with 5 to 10 gr. (0.32 to 0.65) of phenol to the fluidounce (30.), may be used.

COLLOID DEGENERATION OF THE SKIN.

Synonym.—Colloid milium (Wagner).

Definition.—An affection characterized by an outbreak of semi-translucent, yellowish, slightly raised papules, usually upon the face. This rare affection was first described by Wagner in 1866.

Symptoms.—The lesions are pin-head to pea in size, flattened, of a yellowish to orange color, deeply imbedded in the skin, slightly raised above the surface, shiny, and filled with a thick jelly-like material. They are soft and elastic to the touch, and may have a reddish areola containing capillaries. The upper part of the cheeks, the bridge of the nose, and the forehead are the sites usually attacked; exceptionally the dorsum of the hands are involved. The lesions tend to remain discrete, although they may form groups. There are usually only a few papules present. In most instances they have persisted indefinitely. Exceptionally some or all have disappeared spontaneously. They have, in one case at least, undergone inflammatory changes, and faint scars have resulted.

Etiology and Pathology.—The etiology is unknown, although constant exposure to the weather, particularly sunlight, has been cited as causal. There is a colloid degeneration of the connective tissue of the corium and the walls of the bloodvessels.

Diagnosis.—The microscope may be necessary to settle the diagnosis. The location and shiny lemon color are, however, quite characteristic.

Treatment.—The outbreak easily yields to mild roentgen-ray exposures. This was the curative agent employed in a case recently seen. Electrolysis, trichloracetic acid, and curettement should prove successful.

ADENOMA SEBACEUM.

Synonym.—Adenoma of the sebaceous glands.

Definition.—A rare affection characterized by the presence of small tumors of sebaceous gland origin which usually attack the face.

Symptoms.—The outbreaks consist of pin-head- to split pea-sized, rounded or convex, white, yellowish, brownish or reddish papules. The lesions are covered by smooth, rough, or warty skin, with dilated capillaries. They tend to form groups, and occasionally have a linear arrangement. The cheeks in proximity to the nose are usually symmetrically involved. They appear and develop slowly. The lesions are most numerous at the time of puberty. Involution may occur and minute atrophic spots or scars result. Comedones, pigment spots, hairs, warts, and fibromata may be associated conditions. There is an absence of subjective symptoms.

Etiology and Pathology.—The condition in most instances is of congenital origin, and there is frequently an associated defective mental development. The poorer classes and asylums have shown the most cases.

There is a hyperplasia of the sebaceous glands and probably also the sweat glands. Crocker found in addition hypertrophy of the hair follicles.

Diagnosis.—The early appearance, the distribution, the dilated capillaries, and the persistence of the lesions make the diagnosis clear.

Fig. 87.—Adenoma sebaceum.

Prognosis and Treatment.—The lesions tend to persist. Electrolysis may be employed with the needle fastened to the negative pole and a current of 2 to 3 ma. in strength. Trichloracetic acid may be painted on the lesions. Exfoliation may be attempted by painting with resorcin and salicylic acid, each ½ dr. (2.), and alcohol 7 fl. dr. (28.).

MULTIPLE BENIGN CYSTIC EPITHELIOMA.

Synonyms.—Syringo-cystadénome (Török); Epithelioma adenoides cysticum (Brooke); Adenoma of the sweat glands (Perry); Trichoepithelioma papillosum multiplex (Jarisch); Hydradenomes éruptifs (Jacquet and Darier); Cellulone épithéliel éruptif kystique (Quinquad); Cystadénomes épithélieux benius (Besnier); Nævi épithélieux kystiques (Besnier); Hemangio-endothelioma tuberosum multiplex (Jarisch); Acanthoma adenoides cysticum (Unna); Spiradenoma; Spiroma; Adenoma sudoriparum; Syringocystoma.

The term employed by Fordyce has been selected as descriptive of the class of cases which is characterized by the outbreak of multiple, small epithelial tumors occurring chiefly about the face and usually of a benign character. They resemble one another clinically more or less closely. The names applied are used to designate the portions of the skin from which the growths arise, such as in different portions of the rete, from the hair follicles or from the sweat glands.

Symptoms.—The lesions of multiple benign cystic epithelioma consist of pin-head- to pea-size or slightly larger papules or tubercles,

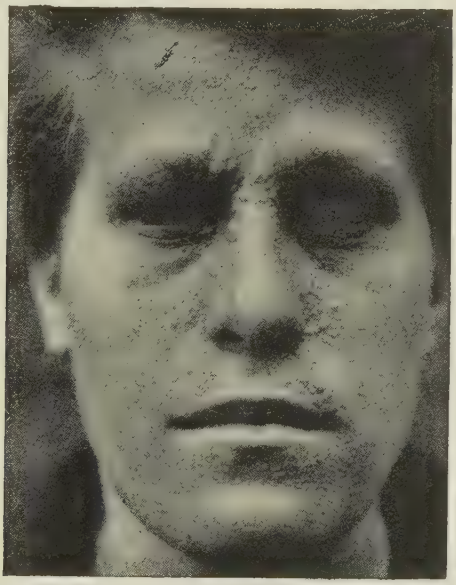


Fig. 88.—Benign cystic epithelioma. (Courtesy of Dr. M. B. Hartzell.)

with a smooth, glistening surface, and having a translucent appearance. They are firm in consistency, of a yellowish, pinkish, or pearl-like color, and telangiectases are frequently present. The lesions tend to a symmetrical arrangement, and are frequently numerous. The face is the usual site of attack, particularly about the lips, the naso-labial furrows, the forehead, and the ears. A rather sparse outbreak may be observed on the neck, shoulders, and upper portions of the arms. The lesions remain discrete, although they may coalesce into small, irregular, nodular tumors. The lesions in the beginning are minute skin-color papules or black dots (Brooke).

Etiology and Pathology.—The disease is rare, and in most instances has been observed at puberty or in early adult life. Certain cases have given a marked hereditary history.

Microscopically the tumors are composed of communicating branching cords and strings of epithelial cells. Cyst-like formations containing colloid or hyaline matter are present.

Diagnosis.—A microscopical examination is, at times, necessary to eliminate molluscum contagiosum, colloid degeneration of the skin, and adenoma sebaceum.

Prognosis and Treatment.—The lesions grow slowly, and after reaching a certain size remain stationary, new papules continuing to appear. The condition does not tend to disappear spontaneously, and only exceptionally do degenerative malignant changes occur.

The roentgen-ray is of benefit when a considerable number of lesions are present. The electric needle or trichloracetic acid or radium may be applied in cases exhibiting but a few papules.

MULTIPLE BENIGN TUMOR-LIKE NEW GROWTHS.

Schweininger and Buzzi have described an affection characterized by the development of multiple lentil- to bean-sized whitish, bluish-white, rounded or slightly flattened, circular or oval elevations, the larger somewhat puckered, of a benign tumor-like character. They bear a resemblance in touch to an elastic, hollow, bladder-like tumor. They tend to become flaccid, and the skin at the site of the lesions shows a minute scar-like depression or striation. They appear slowly, and a considerable time elapses before many are observed.

The shoulders, trunk, and thighs are the usual sites of attack. Women are more prone to an outbreak.

There is a decrease in elastic tissue in the central portion and a peripheral increase. A round-celled infiltration has been observed about the vessels and glands. The sebaceous glands are enlarged. Treatment is without avail.

LYMPHANGIOMA.

The dividing line between lymphatic new growths and lymphangiectasis is rather difficult to draw, as the two processes are often associated.

The subject may be divided into *lymphangiectasis, simple lymphangioma, lymphadenectasia*, and *cystic lymphangioma*. *Lymphangiectasis* is observed in the superficial or deep lymphatics. The *superficial form* is characterized by the development of pin-head- to pea-sized isolated or grouped whitish vesicles which disappear

temporarily under pressure, and when ruptured emit a continuous or intermittent flow of lymphatic fluid. The *deep variety* often produces no change in the skin and can only be recognized by palpation, or raised, irregular cords, or chains of nodules may be discernible. It is usually chronic and tends to attack the lower extremities. Soft nodules may develop which may rupture, forming lymphatic fistules. The deeper structures are frequently most involved, and elephantiasis, phlegmon, lesions of the periosteum and the bone may be present; the overlying skin appears edematous, infiltrated, ulcerated, or cicatricial.

Simple lymphangioma occurs on any portion of the body as circumscribed, elastic tumors, consisting of enlarged lymphatics. The skin covering these tumors may be normal, or reddened and thickened. There may be hypertrophy of the surrounding tissue and the deformities may be as extreme as in elephantiasis. Certain terms have been applied to these extreme examples, *elephantiasis lymphangiectatica* or *pachydermia lymphangiectatica*. The tongue and the lips may present enormous swelling; the former is designated *macroglossia*, the latter *macrochilia*.

Lymphadenectasia has been applied by Virchow to tumors which are most frequently situated in the axillary and inguinal regions. These growths consist of hypertrophied or multiplied lymphatic glands.

Simple lymphangiomata have occurred congenitally. They are supposed to be due to some toxic or other irritating influence. Recurrent erysipelas-like inflammations are often associated. Microscopically the lesions consist of hypertrophied lymphatic vessels and spaces in a network of small-celled connective tissue. The surgeon is called upon to treat the larger lesions. Cystic lymphangioma is a surgical condition consisting of multilocular cysts, usually attacking the neck, and mostly congenital in origin.

LYMPHANGIOMA CIRCUMSCRIPTUM.

Synonyms.—Lymphangioma cavernosum (Besnier); Lupus lymphaticus (Hutchinson); Lymphangiectasis (Tilbury Fox); Lymphangioma superficium simplex (Unna); Lymphangioma capillare varicosum (Török); Angioma cystique (de Smet and Bock); Lymphangiome circonscrit vesiculeux (Broce and Bernard).

Definition.—A patchy outbreak connected with the lymphatics and consisting of pin-head- to small pea-sized deeply seated, closely crowded vesicles.

The affection is rare and was first described by Tilbury Fox, although the term lymphangioma circumscriptum was applied by Morris.

Symptoms.—The irregularly shaped characteristic lesions are small deep-seated yellowish or reddish pin-head- to pea-sized vesicles, with thick walls which are closely crowded into irregularly shaped groups. There are usually several groups present, with a few outlying discrete lesions. One portion of the body alone is involved, usually the left side; the upper part of the extremities is usually attacked, and at times the mucous membranes of the mouth, the pharynx, and the tongue. The skin covering the older lesions may be hypertrophied and wart-like. The lesions may be more or less covered with telangiectases. The vesicles contain a clear, colorless fluid.

Attacks of an erysipelatous type may supervene, and secondarily a localized elephantiasis-like appearance may be observed.

Etiology.—As the disease in most instances begins in infancy or early childhood, the possible etiological factor may be a congenital defect. Nævi may be associated. It has followed surgical operations.

Pathology.—The upper corium shows vesicles or cysts, which are dilated, or newly formed lymph capillaries. There may also be a round-celled infiltration, dilatation and new growths of the blood capillaries and hypertrophy of the epidermal layers.

Prognosis and Treatment.—The disease runs a slow course, and after reaching a certain development remains stationary; spontaneous involution rarely occurs.

Excision, electrolysis, radium or the roentgen-rays are the therapeutic measures advocated.

LUPUS ERYTHEMATOSUS.

Synonyms.—Seborrhea congestiva (Hebra); Lupus erythematodes; Lupus superficialis (Parkes and Thompson); Lupus sebaceus; Ulerythema centrifugum (Unna); Erythème centrifuge (Biett).

Definition.—An affection characterized by the development of variously sized pinkish or reddish scaly patches, usually on the face, less often on the scalp, and rarely on the body, frequently having a symmetrical arrangement and tending to leave atrophic scars. Cazenave gave the affection its present title in 1850.

Symptoms.—There are two forms of erythematous lupus: the localized, so-called discoid, which is chronic, and the disseminated, acute, with constitutional symptoms. The latter is a rare manifestation.

The *discoid* type starts with a slightly elevated pin-head-sized red papule, which gradually enlarges peripherally and forms a sharply circumscribed, discoid, rounded, slightly elevated, more or less infiltrated pinkish or reddish, slightly scaly patch. The

plaque is studded with the patulous openings of the follicles, which are filled with dry sebum and epithelial débris of a dirty gray color. The scale is usually thin, occasionally rather thick, more pronounced at the border of the patch, of a grayish or grayish-yellow color, and dips into the patulous follicular openings.

As the lesions spread peripherally there may be a partial central clearing or they may be uniform throughout. They may remain

FIG. 89.—Lupus erythematosus in mulattress, aged twenty-two years. Duration two years.

indefinitely or disappear spontaneously without leaving a trace, but usually a thin, atrophic, slightly depressed area remains at the site of the former lesion. Several plaques are usually present varying from a dime to a silver dollar, or exceptionally larger in size, and there is frequently a symmetrical arrangement, hence the appellation, "butterfly" disease.

The sites most frequently attacked are the cheeks, the nose, next in frequency the ears and the scalp. Occasionally the scalp

alone is attacked; the patches may then be thicker and less inflammatory in appearance. Lupus erythematosus exceptionally attacks either the dorsal or palmar surface of the hands or fingers; the patches are more ill-defined than upon the face, without or having but a slight scale and of a dark red or violet hue. Occasionally the mucous membranes of the lips, and exceptionally the mouth, the nose, or the palpebral conjunctivæ are attacked. The lesions

FIG. 90.—Lupus erythematosus. Patient, aged forty years; duration, fourteen months; atrophy of the patches distinctly seen.

in the latter regions are bright red or grayish-red in color, but little elevated, slightly infiltrated, and at times undergo atrophic changes. Subjective symptoms are usually absent; itching is occasionally present in a slight degree. Constitutional symptoms are absent in the usual type of case.

The *disseminated type* is always serious, for in the majority of instances death has ensued, either from a rapidly fatal intoxication,

or from a somewhat slower process. The widely distributed lesions may occasionally follow a long-standing discoid type, but usually have no association with this variety. The acute outbreak may first appear upon the backs of the fingers and the hands. The face then becomes involved and later other portions of the body show the outbreak. Many of the lesions may be only pea in size, some are larger, well-defined, reddish in color and slightly scaly. There is an atrophic tendency in the center of the lesions. Some of the lesions may disappear spontaneously, but new ones develop. Fresh crops of lesions are accompanied, at times with fever, bone pains and gastro-intestinal symptoms. Itching and burning may be marked.

Rare Forms of Lupus Erythematosus.—Rarely round infiltrations are found present which resemble the tubercles of lupus vulgaris, which Besnier has designated *lupus érythémato-tuberculeux* and Leloir, *lupus érythématoide.*

Nodular Erythematous Lupus (Crocker).—In addition to the typical plaques of erythematous lupus, numerous round or oval, hemp-seed to bean-sized elevated nodules, resembling the tubercles of lupus vulgaris, are scattered over the upper portion of the face.

Telangiectatic Erythematous Lupus.—Persistent circumscribed patches of erythema, consisting of numerous dilated vessels without scale, are limited to the face. The areas are flat, infiltrated, elevated, and edematous. They may remain stationary for years, finally involuting and leaving atrophic scarring. The usual type of lesions may be present on the scalp.

Erysipelas Perstans Facial.—In this form, described by Kaposi, erysipelas-like swellings are observed on the face, associated with high temperature, typhoid symptoms, and possibly coma. About one-half of the reported cases have died.

Lupus Pernio.—The ears and hands which have been attacked by chilblains may occasionally develop patches of erythematous lupus. The lesions are frequently ill defined and purplish in color. Typical plaques of the disease may be present on the face.

Lupus Livido.—Persistent purplish patches may be observed on the extremities of those with peripheral asphyxia, and at times ulceration occurs. Extreme types are observed in association with Raynaud's disease, and are probably best classed under that disease.

Complications.—Acne-like lesions, bullæ, and folliclis have been observed in association with erythematous lupus.

In rare instances epithelioma has supervened in this disease.

Etiology.—Lupus erythematosus is of comparatively unusual occurrence, appearing in the majority of cases in women between the ages of eighteen and forty years, exceptionally at an earlier period.

The consensus of opinion indicates that the acute, disseminated

form of lupus erythematosus is frequently, if not invariably, of tuberculous origin, but that the discoid variety is probably the result of a toxemia, which may be due to the absorption of certain products emanating from any one of several sources. The teeth or tonsils acting as a source of focal infections have undoubtedly been causal in certain instances.

Pathology. — Histologically the principal changes are found in the corium. There is a perivascular infiltration, chiefly around the glandular structures and horizontal bloodvessels. Edema of the prickle layer and cutis may be present. There has been a considerable variation in the pathological findings.

Diagnosis.—The affection has to be distinguished chiefly from eczema, seborrheic dermatitis, and lupus vulgaris.

Patches of *eczema* fade off into the sound skin, are not symmetrically distributed, do not have patulous follicular openings on the surface, may exhibit oozing, and are markedly pruritic.

Seborrheic dermatitis has a greasy yellow scale, is found on the eyebrows, alæ nasi, and frequently elsewhere on the hairy skin surface, and does not exhibit wide-open follicular mouths.

Lupus vulgaris develops at an earlier age, is very slow in growth, shows typical reddish-brown nodules, and tends to ulcerate. The dilated follicular openings and atrophic scarring should readily distinguish the affection from the non-inflammatory, smooth and entirely bald patches of alopecia areata, and the irregular shaped lesion of folliculitis decalvans.

Prognosis.—In a considerable proportion of cases of the discoid type the patches persist indefinitely after reaching a certain size, a few new lesions appearing from time to time, while in others spontaneous disappearance occurs either without leaving a trace or with atrophic scarring. The disseminated variety in most instances terminates fatally.

Treatment.—The treatment is at times discouraging as to permanent cure, although betterment can be effected. In the superficial type of case, of a markedly inflammatory aspect, mild applications are indicated, a saturated solution of boric acid frequently having a remarkably curative property. Boric acid, 15 gr. (1.); alcohol, 1 fl. oz. (30.), is also of benefit. The mild lotions recommended under eczema, such as calamin, zinc oxide, or resorcin and bismuth subcarbonate, are of use. In the less inflammatory instances zinc sulphate and potassium sulphuret, each 5 to 15 gr. (0.32 to 1.) to the fluidounce (30.) of water, act well; or 50 per cent ichthyol lotion made in water is efficacious. In the deeper seated type of case, trichloracetic acid painted on the surface, the roentgen-ray, radium or carbon dioxide snow are of use. The "snow" treatment is particularly applicable, applied for from five to thirty

seconds, and with mild or firm pressure, depending upon the depth of the lesion.

Internally quinine sulphate in 5-gr. doses (0.32), given three or four times daily, apparently is the most effective preparation. Salicin, 10 to 20 gr. (0.65 to 1.3), four times daily, or sodium salicylate, have also been reported of benefit.

In the disseminated cases, iodoform in tablets coated with phenyl salicylate may be of use. Rest in bed and large doses of quinine are advocated. Symptomatic treatment for the complicating myocarditis, arthritis, enteritis, nephritis and bronchopneumonia may prove necessary. Goeckerman[1] has reported striking results from roentgen-ray irradiation of the glandular system in disseminated cases of erythematous lupus.

XERODERMA PIGMENTOSUM.

Synonyms.—Angioma pigmentosum atrophicum (Taylor); Dermatosis Kaposi (Vidal); Atrophoderma pigmentosum (Crocker); Melanosis lenticularis progressiva (Pick); Lioderma essentialis cum melanosi et telangiectasis (Neisser); Lentigo maligna (Piffard); Epitheliomatose pigmentaire (Besnier).

Definition.—A rare malignant disease, characterized by freckle-like spots, telangiectases, atrophic and other changes, and with a tendency to the formation of epitheliomata. Kaposi was the first to describe the affection in 1870.

Symptoms.—According to Crocker there are six kinds of lesions present in the great majority of cases; freckle-like pigmentations, white atrophic spots, vascular telangiectases, warty growths, superficial ulcerations, and tumor formations.

There may be a history of repeated attacks of erythema on the exposed parts during infancy or early childhood, usually following exposure to sunlight. The first manifestation of the disease consists of pigmented spots, indistinguishable from freckles, which are chiefly observed during the summer months or after exposure to the sun's rays, and are found on the face, the neck, the shoulders, the hands, and the forearms, and in some instances on the scalp.

These lesions may, in the beginning, disappear during the winter to reappear each successive summer for several years, when they remain permanently. The freckles grow in size and number and in the intensity of pigmentation. At a varying period following the freckle-like lesions, telangiectases and later atrophic white spots appear and the skin becomes dry and harsh. Later in the affection the skin becomes thin, atrophic, glistening, wrinkled, shrunken,

[1] Jour. Am. Med. Assn., February, 1923, p. 542.

and covered with keratoses, warty growths, and the telangiectases grow larger and angiomata may appear.

Eczematous areas, fissures, and ulcers develop above the nose, mouth, and eyes, and ectropion, conjunctivitis, and ulcerative keratitis may be present. Photophobia frequently is marked. Epitheliomata tend to develop months or years after the onset of the disease. The exposed portions show the greatest involvement, although freckling and more or less atrophic changes may be observed on the covered portions of the body. There are no subjective symptoms in the early stages of the disease, but later the cachexia due to malignancy is present. Telangiectases and pigmented areas may attack the conjunctiva, the lips, and the mucous membranes of the cheeks.

Etiology.—The disease is congenital, although there is usually no evidence of heredity. In most instances several children in a family are attacked. The affection usually starts between the third month or second year of life, exceptionally at a later period. The affection is probably due to a congenital defect in the skin, which causes a lessened resistance to the effects of the actinic rays of the sun.

Pathology.—Kaposi found a proliferation of the connective tissue of the papillæ, an endarteritis, retraction of the papillæ, obliteration of some and dilatation of the other capillaries, an irregular accumulation of pigment in the rete, downgrowth of the rete pegs into the corium and proliferation of the cutaneous glands and degeneration of their epithelium. The tumors are generally melanotic carcinoma. Metastases are rare.

Diagnosis.—A well-developed case could hardly be mistaken for any other condition.

Prognosis and Treatment.—The affection is almost invariably fatal, death resulting in from a few months to many years. Prophylaxis consists in protecting the patient as much as possible from sunlight. Mild protective applications may be used and excision of the larger growths.

CARCINOMA CUTIS.

Carcinoma cutis is the term applied to those malignant tumors of the skin which usually arise secondarily to carcinoma of the breast or of the visceral tissues. The skin growths consist of epithelial tissue and therefore could properly be termed epitheliomata, the terms carcinoma cutis and epithelioma being employed more or less synonymously.

Carcinoma Lenticularis.—Carcinoma lenticularis, or lenticular carcinoma, occurs most commonly about the breasts of women

secondary to mammary scirrhus or in the scar following breast operations. A few or many firmly imbedded, slightly raised, whitish, yellowish or pinkish, pin-head- to cherry-sized, closely crowded papules or nodules are observed. The skin covering the growths is of a pinkish or reddish color and coursed by dilated capillaries. These nodules may coalesce, forming hard, thickened nodular areas. There may be such extensive involvement of the upper portion of the chest both anteriorly and posteriorly that the armor-like investment causes immobility and interferes more or less with complete respiration. The blocking of the lymphatics and veins by these tumors may cause considerable swelling of the arms. These associated manifestations are typical of *cancer en cuirasse.* Softening and ulceration develop, metastases occur, marasmus supervenes, and death results. The disease runs a moderately rapid course. Exceptionally a few of the nodules disappear spontaneously.

Carcinoma Tuberosum.—The lesions are of a larger type than in the former affection, beginning as small nodules, deeply seated in the corium or subcutaneous tissues. They may be egg or larger in size, and coalesce to form large nodular masses. The overlying skin is distended, shiny, tense, and of a reddish, brownish, bluish or purplish color. The distribution may be somewhat generalized, with a greater number of lesions on the face or extremities. It develops primarily or secondarily, and is usually observed, although rarely at the most, in middle or advanced age. The internal organs may also be attacked. It may run a slow or rapid course. Ulceration, marasmus, and a fatal termination are to be expected.

Secondary Carcinoma.—Secondary carcinoma of the skin frequently shows itself with involvement of the axillary, the intercostal and supraclavicular lymph nodes.

Melanotic or Pigmented Carcinomata.—Melanotic or pigmented carcinomata are primary growths of the skin which have formerly been classed as sarcomata. The lesions usually begin as moles or large pigmented nævi. They run a less malignant course than pigmented sarcoma of the skin but can only be positively diagnosed by a histological examination.

CANCER.[1]

Cancer of the skin is a prevalent and serious disease. Approximately 2 per cent of all dermatoses are of a cancerous nature. Skin cancers may take their origin from all of the epithelial structures of the skin These growths may therefore arise from the surface

[1] Indebtedness is acknowledged to Hazen's excellent publication, Diseases of the Skin.

epithelium, the hair follicles, the sebaceous glands, the sweat glands, the sweat ducts and congenitally misplaced tissues.

Cancer may develop from any of the three types of cells found in the surface epithelium: The prickle cells, the basal cells, and the cuboidal cells. Cancers originating from the hair follicles arise from the basal layer alone, while those growths taking their origin in the glands possibly arise from the basal cells or from the highly differentiated secreting cells.

Prickle-celled Cancer.—**Synonyms.**—Spino-celled cancer; Squamous-celled cancer.

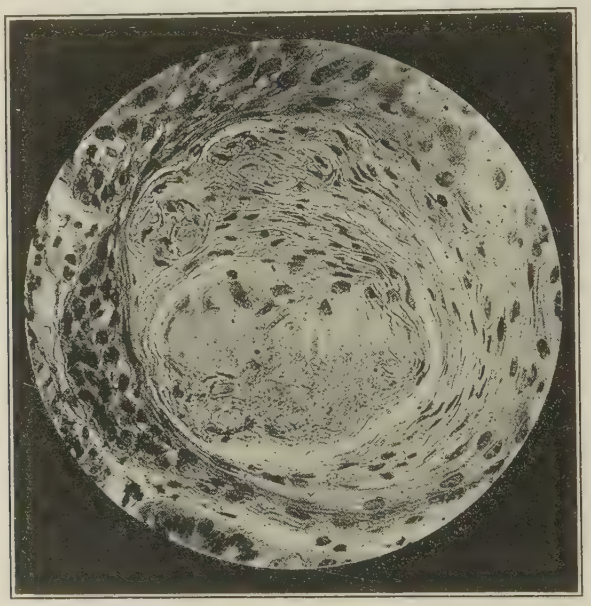


Fig. 91.—Prickle-celled epithelioma, showing an epithelial "pearl." (Courtesy of Dr. Frederick Weidman.)

Definition.—A new growth originating in the prickle-cell layer of the skin or mucous membranes, and usually giving rise to metastasis.

Symptoms.—A minute lump is first observed, which rapidly increases in size, ulcerates, and shows a crust formation. The ulceration increases in size, bleeds easily, and is surrounded by and located on a hard infiltrated area. The tumor growth is either fungous or ulcerative, depending largely upon the amount of cellular infiltration of the base. The surface becomes warty and bears a resemblance to dirty granulating tissue. The circumfer-

ence is slightly elevated and markedly hard. Cancer of this type almost always gives rise to metastases to the lymph glands, occasionally within a month after its first appearance and sometimes not for several years.

The prickle-cell, malignant wart is of a more or less pedunculated character and has an inflammatory infiltration of the base. It is the one variety of cancer arising from the prickle-cell layer which does not tend to metastasize.

FIG. 92.—Epithelioma. Shows the sharply marginated edge. Patient, aged seventy-two years. Duration, eight years.

Distribution.—Cancer of the lower lip develops in approximately 95 per cent of cases from the prickle-cell layer. Neoplasms developing on the upper lip are about evenly divided in their origin between the basal and prickle cells. Cancer of the extremities, trunk, penis, and tongue almost always develop from the prickle-cell layer.

Pathology.—The growth consists of cells of the prickle-cell variety. The cancerous alveoli are large and invade deeply. The cells are large and stain with the acid dyes. Whorl or pearl formation is common. Abnormal mitotic figures are frequently observed in individual cells. The circumference of the growth

shows infiltration with small round fixed tissue cells and a few of the polymorphonuclear type.

Basal-celled Cancer. — **Synonyms.** — Rodent ulcer; Basal-celled carcinoma; Epithelioma; Cancroid; Jacob's ulcer; Superficial skin cancer.

Definition. — A new growth arising from the basal cells of the skin or mucous membranes, with a destructive tendency and not giving rise to metastases.

Symptomatology. — The superficial or discoid type begins as one or more small firm, reddish or yellowish, pearly papules or tubercles, or as a small wart or elevated fleshy mole. The lesion may start as a pea- to bean-sized smooth or roughened keratosis or greasy, scaly seborrheic patch. These benign appearing lesions develop a slight fissure or surface abrasion which persists, slowly enlarges, becoming crusted and eventually, after months or years, ulceration

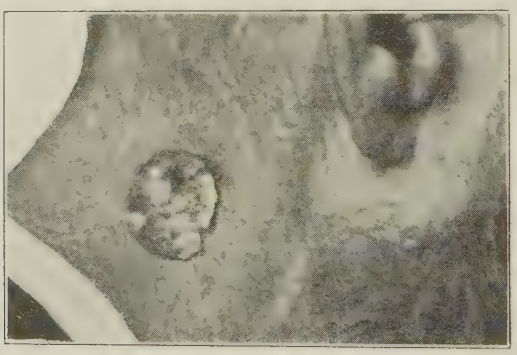


FIG. 93.—Epithelioma of an extremely superficial type.

occurs. The typical superficial basal-celled cancer has a slightly elevated, pearly, rolled border, a depressed center which bleeds readily and has a slight serous or sero-sanguinolent, viscid discharge.

In rare instances the superficial type has a resemblance to morphea and has been termed by Hartzell *morphea-like epithelioma*. This type of epithelial growth tends to eat in and is destructive; the older portion may cicatrize. The tumor is usually from a split-pea to a quarter-dollar in size.

The *rodent ulcer* type of outbreak is characterized by its lateral steady, progressive spread and comparatively little infiltration of the border. It is extremely destructive, eating into the tissues, including muscle, cartilage and bone, and tends to spread peripherally. Rodent ulcer the same as the other types of cancer arising from the basal-celled layer does not spread to the lymphatic glands or cause metastases.

The *deep-seated* or *nodular type* of cancer may begin as a superficial discoid form or a nodular growth. The skin covering the lesion is elevated, of a pinkish or reddish color, and frequently shows dilated capillaries. The nodule may become cherry or larger in size before it ulcerates. The ulcer has a prominent infiltrated and inflammatory border, the surface is granular, with a viscid, often ichorous discharge, and with a crust. Infiltration, fairly rapid growth, an undermined edge, waxy nodules around the circumference, and a papillomatous or vegetating tendency are characteristic of the deep-seated variety. The growth bleeds easily when subjected to the slightest trauma.

FIG. 94.—Epithelioma resembling somewhat an initial lesion. Starting at thirty-eight years of age. Duration, one year.

Distribution.—*Basal-celled cancer* are usually observed on the face, chiefly about the nose, the eyelids, the temporal region and ears, occasionally on the upper lip but rarely on the lower lip. This type of growth may attack the shoulders and upper portion of the trunk.

Pathology.—These growths develop from the basal cells of the skin or mucous membrane. Basic dyes stain intensely, the small cells constituting the growth. These cells are arranged in solid masses, at an early stage, but tend to form long downgrowths. There is a tendency to the formation of long tubules, consisting of cells somewhat separated from each other. Cellular infiltration is only of moderate depth in the skin and the cancerous acini are small. Epithelial whorls or pearls are absent.

Etiology.—The cause of cancer is unknown. It should be emphasized that skin cancer arises from a preëxisting lesion and never takes its origin from healthy epithelium. Certain conditions are predisposing to a malignant growth. Neoplasms rarely develop under the age of forty years. Predisposing causes are the presence of warts, fleshy moles, pigmented nævi and senile lesions of the skin. Among exciting causes of cancer should be mentioned various

Fig. 95.—Epithelioma showing the typical rolled and pearly border. Patient, aged sixty-two years. Duration, two years.

traumata, the irritation of a hot pipe, tobacco, extreme exposure over a long period to the sun's rays, to the roentgen-rays or radium. Workers in petroleum and tar products not infrequently show multiple carcinomata. Prolonged use of arsenic tends to cause the formation of warty lesions which may become cancerous. Certain diseases of the skin, particularly lupus vulgaris and rarely syphilis and chronic inflammatory lesions, become malignant.

FIG. 96.—Rodent-ulcer type of epithelioma.

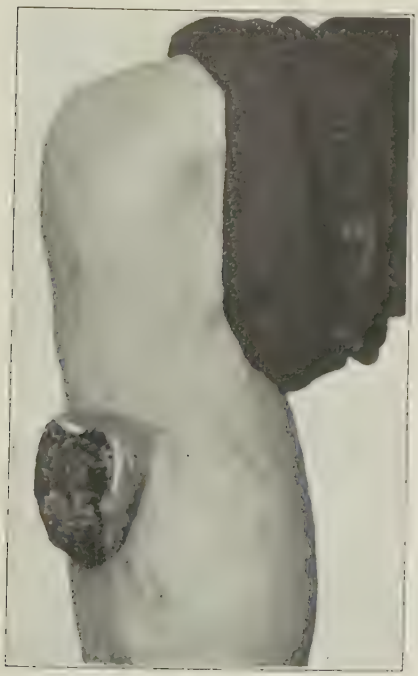


FIG. 97.—Fungating epithelioma. Started at point of injury and has grown slowly for many years.

Diagnosis.—Clinically, at an early stage, it is almost impossible to distinguish a prickle-celled cancer from one arising from the basal-cell layer unless a microscopical examination is made. There are, however, several points which assist in the clinical diagnosis, first basal-celled tumors predominate upon the face and shoulders, while those developing from the prickle cells are usually found on the mucous membranes, the trunk, and extremities. Basal-celled cancer grows slowly and does not spread to the lymphatics or metastasize. The prickle-celled variety grows rapidly and usually shows early lymphatic involvement and metastatic growths.

Three diseases have to be always distinguished: Tuberculosis of the skin, particularly lupus vulgaris; tertiary syphilis; and epithelioma.

Lupus Vulgaris.	Tertiary Syphilis	Epithelioma.
Develops usually at an early age—earlier than puberty.	Develops between twenty and forty years of age.	After forty years.
Slow in growth.	Rapid in growth.	Fairly rapid, but not so quick as syphilis.
Frequently, only one patch.	Frequently more than one patch.	Usually one lesion.
Diagnostic, deep-seated, soft red-brown tubercles.	Dark red tubercles or gummata.	Flat nodule or warty lesion.
Ulceration, irregular in outline, late in disease.	Ulceration characteristic in the shape of segment of circle, serpiginous or kidney-shaped.	Punched-out ulcer, undermined, rolled, pearly border, bleeds easily.
Scar irregular in outline.	Scar serpiginous in outline, kidney-shaped, or the formation of a segment of circle.	Scar rounded or irregular.
Possibly a tuberculous family history; other signs of tuberculosis present.	Syphilitic history or old scars present.	History of trauma or some other previous lesion present.
Tuberculin tests positive.	Wassermann and luetin tests, usually positive.	Negative to all these tests.
Histological examination shows characteristic arrangement of cells, giant cells, and a few tubercle bacilli.	Characteristic picture.	Characteristic picture.
Inoculation test into a guinea-pig positive.	Positive for monkeys and rabbits.	Inoculation test, negative.

Prognosis.—If prickle-celled cancer is recognized at an early stage and radical surgical treatment is carried out the prognosis is favorable. Local destructive measures are usually effective in basal-celled cancer even if growths are of long standing.

Treatment.—Prickle-celled cancer and the draining lymphatic glands should be radically removed with the knife.

Basal-celled cancer should be treated with the roentgen-ray or radium. If the growth has a roughened or papillomatous surface curettage should be used before the roentgen-ray or radium application.

The roentgen-ray may be employed in the following manner: Distance: 8 inches; spark gap, 6 inches; 2 ma., time, six minutes. No filter is employed. A second treatment may be given four weeks after the first exposure.

If only a small quantity of radium, a 10- mg. plaque, is employed, the treatment should last for two and one-quarter hours. A second application may be made in from four to six weeks.

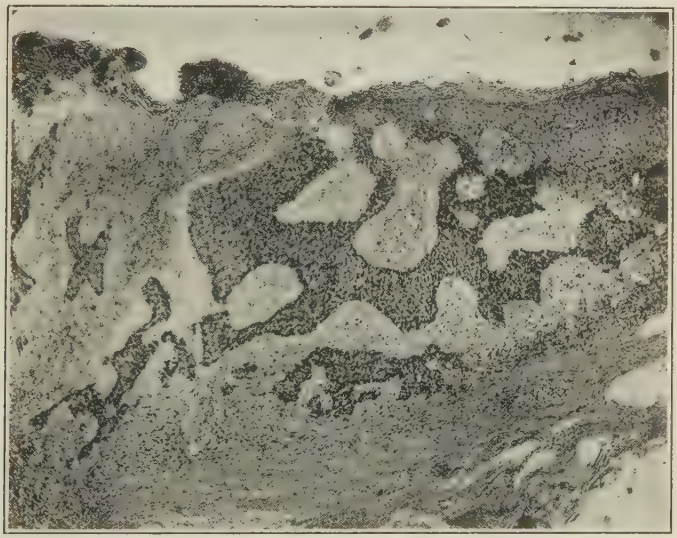


FIG. 98.—Basal-celled epithelioma. (Courtesy of Dr. Frederick Weidman.)

Other methods which may be employed in the treatment of basal-celled cancer are various caustics, the electro-cautery, fulguration, or excision.

The caustics which have been employed by various dermatologists are pyrogallol, zinc chloride, arsenic and acid nitrate of mercury.

Pyrogallol is employed in a salve, 25 to 40 per cent in strength, using the following formula: Pyrogallol, 2½ to 3 dr. (10. to 12.); salicylic acid, 25 to 50 gr. (1.65 to 3.3); simple cerate, 1 to 2 dr. (4. to 8.); petrolatum, 1 oz (30.). It is spread on a piece of lint, muslin, or linen, the exact size of the growth, and fastened to the tumor by adhesive straps. This remains for four days, and a

fresh application is made for the same period, and the procedure repeated unless the action has been sufficiently deep or the pain becomes too severe.

Zinc chloride is usually employed as Bougard's paste, which consists of: Farinæ trit. (wheat flour); pulv. amyli, āā ʒ ss (15.); pulv. acidi. arseniosi, 4 gr. (0.25); pulv. hydrarg. chloridi corr., 2 gr. (0.12); pulv. hydrarg. sulph. rub.; pulv. ammonii chlorid., āā 20 gr. (1.3); zinc chloride cyst., 4 dr. (15.); aquæ fervid, (30.). The first ingredients are mixed, the zinc chloride dissolved in water, and the two mixtures rubbed-up together. This is spread on any suitable material and applied to the growth, extending slightly beyond the border. The depth destroyed is usually one or two times the thickness of the layer of paste. It takes about twenty-four to forty-eight hours for sufficient destruction; it is sometimes necessary to remove the mummified mass by paring it away and reapplying a fresh plaster (Stelwagon). The inflammatory reaction is marked and the pain very severe. A small quantity of cocaine hydrochlorate may be added to somewhat alleviate the pain. In superficial lesions one application is usually sufficient. The slough separates in from five to twenty days.

Arsenic is employed in the form of arsenious acid, either 2 parts to 1 of mucilage of acacia or equal proportions, depending upon the action required. A saturated solution of cocaine hydrochlorate is added to counteract the severe pain. The application should be limited to an area not larger than a square inch in size. It is recommended in fairly deep-seated growths. It requires from twelve to thirty-six hours for sufficient action, and produces marked inflammatory swelling and edema. A second application may be required.

Caustic potash is powerful and efficient in its action. The stick is applied with a considerable amount of pressure to the growth, and immediately after its removal the area is neutralized with acetic acid. It acts rapidly and goes deep into the tissue. It therefore should not be applied to growths on the alæ nasi, as it may penetrate into the nares. The application is extremely painful, but the pain disappears immediately after neutralization.

PAGET'S DISEASE.

Synonym.—Malignant papillary dermatitis (Thin).

Definition.—Paget's disease is rare and characterized by an eczematoid patch, which terminates in a malignant growth. Paget first described the affection in 1874.

Symptoms.—The disease starts with a slightly scaly marginated patch, which becomes reddened and itching, granular, raw, with a

viscid discharge. It may remain in this condition for months or years, eventually spreading, becomes fissured, eroded, thickened, ulcerated, and nodular, and scirrhous carcinoma develops. The involved area is rarely more than a few inches in diameter. The affection is usually limited to one nipple and the surrounding skin. The nipple and areola finally ulcerate and nodules are found in the breast. Both breasts may be attacked. The malignant changes are usually observed in the breast within two years after the original patch. Although the nipple is the most common site of attack, the scrotum, the penis, the pelvic and perineal regions, the lip, the

FIG. 99.—Paget's disease of the breast. (Ormsby.)

nose, the axilla, the umbilical region, the buttocks, and the forearm have also been attacked.

Etiology.—The disease occurs in most instances between fifty and sixty years of age in the female sex, and is limited to the nipple region; usually the right. The original eczematous patch is probably malignant from the beginning. Psorosperm-like bodies have been demonstrated, which are probably simply degenerated epithelial cells.

Pathology.—There is an inflammation of the papillary region of the corium, and edema, vacuolation, destruction and abnormal

proliferation of the epidermic cells; and also a proliferation and degeneration of the lactiferous canals and glandular tissues.

Diagnosis.—The diagnosis should be clear if the age of the patient, the margination, the infiltration, the red, raw, granulated surface, and later the retraction of the nipple and the involvement of the deeper tissues are considered. In the early stage it is, at times, rather difficult to differentiate from eczema.

Prognosis and Treatment.—Excepting in the early stage the prognosis is grave.

Radium, the roentgen-rays, and excision are the procedures advocated. Excision is advised. The roentgen-rays in the early stage may effect a cure.

SARCOMA CUTIS.

Synonyms.—Sarcoma of the skin; Sarcomatosis cutis.

Sarcoma of the skin is divided into *non-pigmented sarcoma* of a local or generalized distribution; *melanotic sarcoma;* and *multiple pigmented* (*hemorrhagic*) *sarcoma* (Kaposi). This classification corresponds to that inaugurated by De Amicis.

Non-pigmented Sarcoma.—Non-pigmented sarcoma may consist of but a single growth, or several more or less generally distributed. The type represented by the single growth is relatively less malignant than the other forms of sarcoma. The tumor varies in size from a pea to an orange or larger; it may be white, pale red, or bluish in color, and is often covered by capillaries. It is nodular, encapsulated, mushroom-like, and occasionally pedunculated. The blood supply may be so abundant that pulsation is felt on palpation of the tumor. The growth at times develops slowly, months or years elapsing before ulceration, generalized skin growths, and metastases occur.

In the *generalized type* of non-pigmented sarcoma, several tumors may develop simultaneously on the same or distant portions of the skin. This variety of sarcoma may primarily attack the skin or be secondary to visceral tumors. The growths vary considerably in size, from a pea to an orange or larger, of a white, red, or bluish color. They have their seat in the skin or subcutaneous tissue, and may be few in number or abundant. All portions of the cutaneous surface may show involvement, the tumors are general in distribution and widely separated, or contiguous and limited to the one portion of the body. The tumors tend to ulcerate and give rise to metastases.

Melanotic Sarcoma.—This extremely malignant type of sarcoma has its beginning as a pigmented spot, an abraded black superficial blister; a dilated group of capillaries; a purpuric spot, in the

"melanotic whitlow" of Hutchinson; in the pigmentation around the border of the nail, or its source is not readily determined. The first observed changes in melanotic sarcoma may consist of a dark-colored abrasion with a smooth, irregular, or slightly fungating surface, or an insignificant tumor of a pea to small nut in size. It tends to attack the dorsal or lateral aspects of the hands or feet, at times the face and mucous membrane of the lips.

Multiple Pigmented (Hemorrhagic) Sarcoma (Kaposi).—Kaposi was the first to describe this affection. The extremities, chiefly the lower, are first attacked by small, discrete, nodular, grouped, pea or slightly larger sized lesions. In addition there may be thickened or diffused infiltrated areas. The various lesions are firm in consistency, of a reddish-blue or purplish, dark brown, or black color, and tender and painful, or both. Angioma-like lesions may also be present. Some of the tumor may exhibit a central depression. Spontaneous involution of some of the growths may occur and discolorations or scars remain. The capillaries are dilated around the nodules. New tumors and infiltrated areas continue to appear and the legs chiefly below the knees may become slightly or markedly enlarged. The course of the disease is slow. In certain instances, two to twenty years have elapsed before ulceration and metastases to the internal organs have occurred. The general health is usually unimpaired until the malignant stage is reached.

Etiology.—The cause of sarcoma is unknown. Local irritation has apparently been predisposing, especially in the single non-pigmented and melanotic varieties. The cases are usually observed under twenty and over forty years of age. Almost all of the cases of multiple pigmented sarcoma have developed in males after forty years of age.

Pathology.—The tumors of the *non-pigmented variety* consist chiefly of cells of the round or a combination of the round and the spindle types. The early lesions may show an alveolar arrangement of the cells. Some of the growths may exhibit a predominance of fibrous tissue (*fibrosarcoma*) or an increase of the lymphatic elements (*lymphosarcoma*), or there may be an increase of connective tissue, originating from the adventitia of the vessels, and the formation of new bloodvessels (*angiosarcoma*).

Melanotic sarcomata are composed of small and large round cells and spindle-shaped cells, in most instances the latter. There is frequently an alveolar arrangement. The increased amount of pigment is chiefly the product of the neoplastic cells. *Multiple pigmented sarcoma* consists of round, fusiform or spindle cells, fibrous tissue, and increased pigmentation, secondary to capillary hemorrhage. The bloodvessels are dilated.

Diagnosis.—A pigmented, rapidly growing tumor, beginning in a mole or congenital deposit of pigment, suggests the diagnosis of a sarcoma. A microscopical diagnosis may be necessary to prove the diagnosis.

Prognosis and Treatment.—Death is to be expected in the generalized cases and also in the localized instances unless complete excision is performed. The melanotic variety runs a rapidly fatal course.

The *multiple pigmented* (*hemorrhagic*) *sarcoma* (Kaposi) may run a course over many years, eventually becoming malignant and causing death. Rarely spontaneous recovery occurs.

Early operation is advised except in the latter class of cases. The roentgen-ray has caused a disappearance or betterment of the lesions in Kaposi's type. Arsenic given hypodermically has been exploited in the latter variety.

MYCOSIS FUNGOIDES.

Synonyms.—Granuloma fungoides; Granuloma sarcomatoides; inflammatory fungoid neoplasm; Fibroma fungoides; Lymphodermia perniciosa; Sarcomatosis generalis; Ulcerative scrofuloderma; Eczema tuberculatum.

Definition.—A malignant disease, running a chronic course which is characterized by eczematoid areas, infiltrations, nodules, tumors, ulcerations, and terminating fatally.

The disease was first described by Alibert in 1814, who later named it mycosis fungoides.

Symptoms.—The affection is divided into three stages: The *premycotic*, the *stage of infiltration*, and the *fungoid*. All the stages are usually found in sequence, with months or years elapsing between each period. The tumor stage, however, may usher in the disease, or all three stages may be observed together.

Premycotic Stage.—Mycosis fungoides is usually observed as an outbreak of circumscribed, localized, or somewhat generalized areas of dermatitis accompanied by intense itching. The patches may be dry and resemble eczema, psoriasis, erythema, or urticaria. The lesions may be moist and the counterpart of a vesicular eczema. They tend to fade off into the sound skin, are of a variable size, at times circular in outline, of a pink, bright, or dark red color, and may be persistent, or disappear and again reappear.

Infiltration Stage.—The patches become thick and slightly or considerably elevated, sharply marginated, or new infiltrated areas and nodules develop. The nodules are from pea- to hazel-nut in size, and may remain discrete or by confluence form irregular raised nodular plaques. The lesions tend to have an irregular or circinate outline, involuting in the center and spreading peripher-

ally. A few of the lesions may spontaneously disappear but the majority persist. The color varies from a pink, red-brown or violet.

Fungoid Stage.—The deep-seated button-like nodules increase in size and large fungating tomato-like tumors are formed. The tumors are orange or larger in size, flat, pedunculated, or lobulated, and of a pink or red hue. The growths may become enormous in size and consist of blood-red, suppurating, unhealthy granulations. Ulceration eventually occurs. The itching is less severe, usually in the fungoid, than in the premycotic and infiltrated stages.

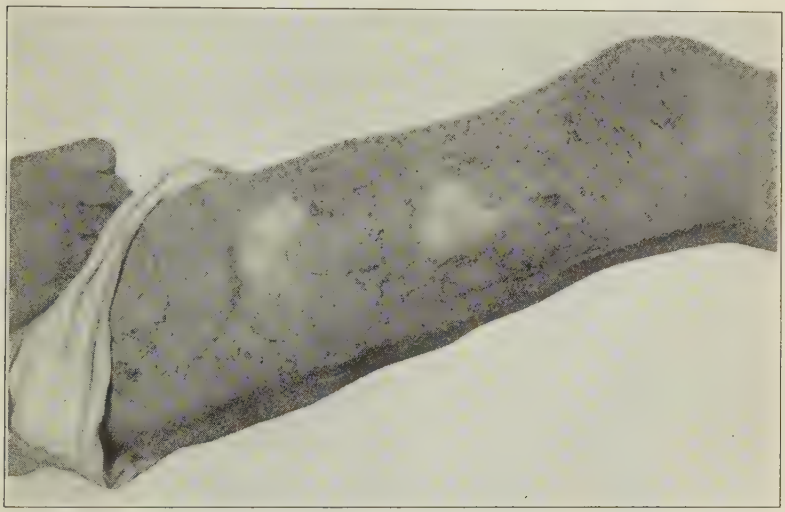


Fig. 100.—Granuloma fungoides (prefungoid stage).

Etiology.—Three-quarters of the cases have occurred in men, mostly older than forty years. No cause has been determined. There is no family or hereditary tendency. The majority of investigators believe that it is caused by some microörganism which has not as yet been isolated.

Pathology.—Although mycosis fungoides was originally thought to be related to the sarcomata, the majority of investigators now believe it is a separate affection.

The earliest changes in the skin consist of a congestion of the capillaries in the corium, with a surrounding cellular infiltration and a slight fibrous proliferation. The cells resemble those found in a small round-celled sarcoma. In addition there are small numbers of plasma and mast cells. The epidermis is either normal or presents a slight edema, acanthosis, or parakeratosis. The mycotic

stage shows an increase of granulomatous tissue, which involves the papillæ, causing an elevation above the surface and finally ulceration. There is a basophilic degeneration of the collagen and elastin. An eosinophilia and also a leukocytosis has been found in some cases.

Diagnosis. Diagnosis may prove difficult in the early stage of the affection. The advent of the small nodules and infiltrated plaques should readily differentiate the condition.

FIG. 101.—Granuloma fungoides (fungoid stage).

Prognosis and Treatment.—Although the disease can be held in check over months or years, in only a few cases has cure been effected; roentgen-ray treatment is the one measure that causes the disappearance of the lesions, helps the itching, and prolongs the life of the patient. Arsenic may be administered.

LEUKEMIA CUTIS.

Cutaneous, subcutaneous and mucous membrane lesions of various kinds are occasionally found associated with leukemia. They are found in the acute and chronic types of the affection, and also in the lymphatic and myeloid varieties.

Symptoms.—There are two types of cutaneous outbreak, a *superficial* and a *deep variety,* or a combination of the two. The *first* is characterized by hemorrhages, petechial and diffuse, papular, vesicular, urticarial, and pigmented lesions, symptomatic erythema, diffuse scaly erythrodermia, and rarely a moist or scaly dermatitis accompanied by intense itching. The deeper lesions consist of ulcers and necrotic areas usually attacking the mucous membranes, and secondary to the breaking down of hemorrhagic or lymphomatous deposits. Nodules and tumors of various size, shape, and color are also observed. Although any portion of the body may be attacked the usual sites of attack are the extremities and face. The nodules may be from a pea to a coffee-bean in size, few or numerous, of a pale, waxy, reddish, brownish-red, or yellow-red color, firm or soft in consistency, movable, smooth or scaly, oval, round, flat, and at times with a depressed center. Telangiectases may be associated. The tumors are small, hen's egg or larger in size, few or present in large numbers, and grow slowly, without the tendency to break down. Exceptionally in acute lymphatic leukemia greenish tumors (*chloromata*) occur.

Etiology and Pathology.—The skin lesions are a part of the general leukemic process. The leukemic nodules are located in the middle and lower corium and upper portion of the subcutaneous tissue, and consist of accumulations of lymphocytes. These cells are not limited to the nodules and tumors but are found generally throughout the skin even where clinically no derangement is found. The cellular infiltration is chiefly found around the bloodvessels and coil glands.

Diagnosis.—Leukemic cutis has to be differentiated from mycosis fungoides, sarcoma, and eczematous outbreaks. The blood-findings offer a diagnosis of the underlying disease.

Prognosis and Treatment.—The systemic leukemia has to be treated by the proper means. The cutaneous lesions have been helped, in some instances, by hypodermic injections of arsenic and the roentgen-ray. The prognosis for the underlying cause is unfavorable.

Pseudo-leukemia Cutis.—Pseudo-leukemia (Hodgkin's disease) causes an outbreak of lesions almost the counterpart of those already described, except that the papules and urticarial-like lesions associated with itching are of more frequent occurrence.

ULCERATING GRANULOMA OF THE PUDENDA.

Synonyms.—Serpiginous ulceration of the genitals; Groin ulceration; Sclerotizing granuloma of the pudenda; Perforating granuloma of the thigh; Granuloma inguinale tropicum; Venereal granuloma.

Definition. A disease of the tropics, characterized by the development of chronic ulceration of the groin and neighboring parts, with papillary overgrowth. Conyers and Daniells, in 1896, were the first to record instances of the disease.

Symptoms.—The affection starts as a distinct or ill-defined papular and nodular infiltration which tends to ulcerate. The disease spreads by continuous eccentric peripheral extension and by auto-inoculation of opposing surfaces. Papillomatous masses form on the affected areas and scar-tissue formation is marked following involution. The ulcerated areas are bright red in color. The process is superficial and unaccompanied by lymphatic involvement. There may be an offensive discharge from the affected parts. The sites usually attacked are the labia, the vagina, the penis, the urethra, the scrotum, the ano-rectal region, the pubes, the groins, and rarely the bladder.

Fig. 102.—Granuloma inguinale. (Courtesy of Dr. A. Haines Lippincott.)

Etiology and Pathology. The disease attacks all races, but chiefly the negroes in the tropics (British Guiana, East Indians, Fiji and Solomon Islanders, and those in the New Hebrides). Females, between the ages of fourteen and thirty years, are most frequently attacked. The affection is contagious, auto-inoculable, and frequently venereal in origin, although not syphilitic. The cause of the affection has not been proved.

The histological picture shows granulomatous changes, papillary elongations, and proliferation of the rete.

Prognosis and Treatment.—The condition runs a persistent course, rarely involuting spontaneously, and is difficult to cure. Excision or curettage, followed by cauterization and the roentgen-rays, have proved curative. Excellent results have been reported from the use of intravenous injections of 5 cc of a 1 per cent aqueous solution of potassium and antimonium sulphate every second day.

GRANULOMA ANNULARE.

Synonyms.—Ringed eruption on the fingers (Colcott Fox); Lichen annularis; Ringed eruption of the extremities (Galloway); Sarcoid tumors (Rasch, Galewski); Eruption chronique circinée de la main (Dubreuilh); Neoplasie nodulaire et circinée (Brocq); Erythematosclerosis circinée du dos des mains (Audry).

Definition.—A disease characterized by an aggregation of nodules or papules into a ring which enlarges peripherally while it involutes centrally (Crocker).

Crocker was the first to describe this rare affection in 1893. Graham Little has written a very complete paper on the subject and analyzes all reported cases.[1]

Symptoms.—The malady usually develops slowly, occasionally rapidly, as one or more discrete, slightly raised, firm or soft, deeply seated nodules which form a ring or crescentic group. The fully developed nodules are whitish or ivory-like, often shining and glistening in appearance, at times with a bluish-red or purplish-red tinge, small to large pea in size, and somewhat flattened. The coalesced nodules form a perfect ring, a segment of a circle or an irregularly shaped patch. The ringed band of lesions is $\frac{1}{16}$ to $\frac{1}{8}$ inch or slightly larger in width, and distinctly elevated. There may be a narrow pinkish or reddish areola contiguous to the plaque. The skin within the ring may be normal or somewhat atrophied and of a pinkish hue. The patches are usually from 1 to 2 inches, occasionally larger in diameter. The lesions are found in most instances on the dorsal surface of the hand and fingers; in a few instances the wrists, the feet, the ankles, the neck, the elbows, the knees, and the buttocks have been attacked. The face and scalp are rarely involved.

Etiology and Pathology.—The cause of the affection is unknown. Children of either sex are most frequently attacked. The summer season and a tuberculous tendency are supposedly predisposing.

Histologically there is a cellular infiltration in the cutis which

[1] British Jour. Derm., 1908, pp. 213, 248, 281, 317.

corresponds to that found in certain chronic inflammatory processes (Galloway). Graham Little found a deep hypodermic inflammation spreading toward the surface, chiefly around the vessels.

Prognosis and Treatment.—The disease runs a chronic course, new lesions appearing from time to time, and there is a tendency toward spontaneous disappearance.

The two cases I have treated were cured by a few exposures to the roentgen-rays.

GOUNDOU.

Synonyms.—Anaklire; Henpuye; Big nose; Dog nose.

Goundou was first described by MacAlister in 1882. It occurs in childhood, and is characterized by the development of symmetrical bean and larger shaped tumors on the sides of the nose, apparently caused by a specific osteitis of the nasal process of the superior maxilla. The tumors increase to the size of a hen's or ostrich's egg. The tumors are associated with persistent cephalalgia and purulent rhinitis. It has been found chiefly in dark-skinned races. The pathology, etiology, and curative measures are not as yet determined.

CLASS 8.

NEUROSES.

HYPERESTHESIA.

Hyperesthesia is an exaggerated sensitiveness to external impressions. Usually only a small portion of the cutaneous surface exhibits this phenomenon, but it may become general. The hypersensitiveness to external factors may be slight, causing unpleasant sensation upon contact or upon variation in temperatures, exposure to heat or cold (*thermalgesia*), or so severe as to cause external pain from the slightest touch (*hyperalgesia*).

Hyperesthesia may be symptomatic or idiopathic; almost invariably a cause is determinable. It is due to functional neuroses, hysteria, neuritis, derangement of the nerve centers or the terminal nerve filaments, and is a symptom of various nerve diseases. It is observed in association with certain cases of herpes, urticaria, etc.

Treatment.—Treatment is directed toward the underlying condition.

Meralgia Paresthetica.—This rare affection is characterized by tingling, formication, heat, cold, and occasionally numbness, tension, constriction, distention, hyperesthesia, anesthesia, imaginary movements, pruritus, and rarely a sense of throbbing of the lower two-thirds of the thigh. The symptoms are persistent when the patient is standing or walking. Various etiological factors have been mentioned, such as neuritis, gout, rheumatism, alcoholism, and following various infectious diseases, etc. The region supplied by the external femoral nerve is usually at fault. Betterment has resulted from massage and roentgen-ray exposures.

DERMATALGIA.

Synonyms.—Neuralgia of the skin; Rheumatism of the skin.

Definition.—Painful sensations of the skin without structural change.

Symptoms.—The pain is of a burning, stinging, or shooting character, frequently worse at night, and may be increased by external contact. It is usually observed on hairy parts, and involves circumscribed areas.

Causalgia is a variety of dermatalgia characterized by burning pain; it is a symptom of glossy skin and was described by S. Weir Mitchell.

Etiology.—The cause of the affection may be unascertainable, but it is frequently associated with nervous disorders. It has been found associated with uterine-ovarian conditions, hysteria, neuritis, syphilis, diabetes, malaria, locomotor ataxia, rheumatism, and after exposure to cold.

Diagnosis.—It is distinguished from hyperesthesia by its spontaneous character rather than being excited by external factors. It is frequently associated with hyperesthesia.

Treatment.—The treatment is symptomatic and directed toward the underlying condition.

ERYTHROMELALGIA.

Synonym.—"The red neuralgia."

Definition.—An affection characterized by pain, redness, and local elevation of temperature.

S. Weir Mitchell described this rare affection in 1872.

Symptoms.—The disease begins in a limited area and gradually, but, as a rule, slowly extends. The temperature of the affected part is usually increased, there is hyperesthesia, redness, burning, aching, and neuralgic pain. The latter is particularly marked when the part is warm. In extreme instances the affected part is somewhat swollen, the veins engorged, and there is arterial throbbing. The pain is paroxysmal in character, lasting for several minutes to an hour or more, or may be continuous. The malady may attack one or both hands and the feet as well, or is limited to one or several fingers or toes. The nails may show trophic changes. Local hyperidrosis is at times an associated condition.

Etiology and Pathology. Males are usually attacked, particularly during early life.

It is probably caused by central organic disease, central functional disturbance, or peripheral irritation or disease.

Histological examination in one instance showed a peripheral neuritis (Mitchell and Spiller).

Prognosis and Treatment.—Cure can hardly be expected.

Nerve-stretching, and cutting the nerves supplying the affected part, has given only moderately successful results. Sodium salicylate, antipyrin, acetanilid, or suprarenal extract may be given internally. Mild roentgen-ray treatment has also been administered.

ANESTHESIA.

A condition characterized by lack or impairment of sensation in certain portions of the cutaneous surface. It is of central or peripheral nerve origin. The skin may be normal or structurally changed. The sense of touch may be partially or completely absent. It may be idiopathic or symptomatic, from within or without. The condition may last only momentarily or indefinitely. Only one small area may be affected, one or both sides of the body. In certain instances it is associated with syphilis, scleroderma, leprosy, etc. It is frequently associated with hysteria. The cure of the affection is dependent upon the removal of the underlying cause.

PRURITUS.

Definition.—An affection of the skin without eruption, except as the result of scratching, characterized by itching, burning, and prickling sensations.

Pruritus may be divided into *universal* or *localized*. Universal pruritus is divided according to its etiology into symptomatic universal pruritus, pruritus from congenital cutaneous hyperesthesia, winter pruritus, bath pruritus, and senile pruritus.

Symptomatic universal pruritus may precede or be associated with urticaria. It is also seen in association with emotional disturbances, functional and organic nervous diseases, toxic infections, and after the administration of certain drugs, such as opium. Severe itching, at times, accompanies jaundice, gastro-intestinal conditions, particularly constipation, rheumatic affections, nephritis, diabetes, etc. The cure of the underlying cause usually results in a cessation of the pruritus.

Pruritus from Congenital Hyperesthesia.—Pusey has met with cases in which from earliest childhood there is severe itching on exposure of the body to air, from the irritation of bathing and of clothing, and especially when the body becomes heated in bed. The skin is so sensitive that dermographism can be readily excited, but the itching occurs independently of wheal formation.

Winter Pruritus (*Pruritus Hiemalis*).—Itching is observed with the advent of the cold weather and disappears with the warm weather of spring. It is most severe upon removal of the clothes at night and continues for one or two hours after retiring. The skin surface shows an exaggerated "goose-flesh" appearance upon being exposed to the air. The pruritus is either absent or slight during the day. In a mild form it is of common occurrence.

Hutchinson has described a summer pruritus associated with the heat of summer, but it apparently only rarely occurs.

Bath Pruritus.—The itching is excited by bathing, and may last but a few minutes or for several hours after the bath. It seems to be prolonged if the patient retires immediately after bathing. It may be mild or quite severe. The itching occurs in those with hypersensitive skins.

Senile Pruritus.—The itching is usually slight or moderate, and is observed as an accompaniment of the senile changes in the skin. It is more severe in winter, most pronounced on the legs, worse at night, and is somewhat excited by rough clothing. Exposure to heat causes an acute exacerbation. It may occur independently of old-age changes in the skin. Rarely the patient has a delusion that the itching is caused by organisms crawling on the skin (*acarophobia*).

Local Forms of Pruritus.—Rarely there may be persistent pruritus of the palms, the soles, or the tongue, but the local forms usually encountered occur about the genitals and anus.

Pruritus Ani et Vulvæ.—There is frequently an associated itching of the genitals, the perineum, and the anus. In the male sex the anal region often alone is pruritic. The itching may be mild in character, but is frequently so severe that the patient is unable to sleep at night and is uncomfortable during the day. The pruritus usually is most severe at night, but may be of a paroxysmal character, with periods of entire freedom. Often, however, it is continuous. The scratching frequently gives rise to a secondary eczema, excoriations, macerated and whitened areas, and thickening. The incessant itching causes a great depression of the nervous system, and the individual may reach the stage of melancholia.

Pruritus scroti is of uncommon occurrence.

There may be pruritus of the urinary meatus, which is usually due to some local irritation, such as vaginitis, urethritis, stricture, stone, or cystitis.

Etiology of Local Pruritus.—The affection has been associated with or is excited by hepatic derangement, tumors causing congestion of the pelvic viscera, uterine and ovarian disorders, intestinal catarrh and fermentation, the gouty diathesis, fissures, fistulæ, and hemorrhoids. Frequently no cause can be determined excepting the neurotic character of the patient.

In children it results from intestinal worms.

Diagnosis.—The diagnosis should offer no difficulty, as pruritus is the only symptom present, all eruptions being secondary.

Prognosis and Treatment.—If the underlying cause can be determined and removed the prognosis is favorable; otherwise, treatment may only relieve somewhat rather than cure.

Internal treatment consists in keeping the bowels thoroughly moved, the kidneys active, and the administration of drugs which

have an effect on the pruritus. The diet should be plain, free from all highly seasoned foods, and easily digestible. Large quantities of water should be taken. All possible underlying causative factors should be removed. The antipruritic drugs administered are phenacetin, bromides, chloral, acetanilid, antipyrin, etc.

The following prescriptions have proved of benefit in the generalized cases: Thymol, gr. j (0.06); phenol, f℥ss (2.); camphoræ, ℥j (4.); powdered bismuth subcarb., ℥ss (15.); powdered talcum, ℥iv (120.); phenol, ℥ij (8.); menthol, gr. viij (0.5); thymol, gr. v (0.3); powdered zinc oxide, ℥j (30.); acid boric, ℥ss (15.); glycerin, f℥ss (15.); liq. calcis, q. s. ad Oj (480.); menthol, gr. xii (0.8); phenol, f℥ss (2.); camphoræ, ℥j (4.); pulv. bismuth subcarb., pulv. amyli, āā ℥j (30.); petrolatum, ℥ij (60.) liquor carbonis detergens, f℥ss (15.); phenol, f℥j (4.); menthol, gr. vj (0.36); powdered zinc oxide, ℥ss (15.); glycerin, f℥ij (8.); camphor-water, Oss (240.).

In the treatment of *bath* and *winter pruritus* the skin is frequently dry and unusually sensitive, and therefore soap and water act as irritants. The patient should therefore use very little soap in bathing and bathe in bran water (3 quarts sewed in a bag for each bath). Rough underclothing should not be worn, light clothing, linen or silk underwear being worn next to the skin. The rubbing in gently of an ointment, twice daily, containing menthol, gr. ij (0.12); sodii salicylate, gr. x (0.65); lanolin, ℥ij (8.); cold cream, ℥ vj (24.), is often efficacious. The same preparations are used in the localized forms of pruritus as have been suggested in the generalized type. Stronger preparations are indicated if the milder fail. Liq. carbonis detergens, ℥j to ij (4 to 8.) to the ounce (30.) of zinc oxide ointment; menthol, gr. ij (0.12); oil of cade, ℥ss to ij (2 to 8.); powdered zinc oxide, powdered starch, āā ℥ij (8.); petrolatum, ℥iv (15.) The roentgen-rays, mild exposures, is of avail in certain cases when all other remedies have failed. Bacterial injections, using the colon bacillus and the streptococcus fecalis, may assist greatly in the relief of pruritus ani.

CLASS 9.

DISEASES OF THE SKIN CAUSED BY VEGETABLE ORGANISMS.

A. DISEASES CAUSED BY COCCI.

IMPETIGO CONTAGIOSA.

Definition.—A contagious disease of the skin, consisting of vesicles or pustules with subsequently honey-color crusts.

FIG. 103.—Impetigo contagiosa. (Courtesy of Dr. G. H. Fox.)

Symptoms.—The affection usually starts with the appearance of small vesicles, occasionally with papulo-vesicles or pustules,

which enlarge, become purulent, and dry up, forming a honey-colored crust. The crust is "stuck on" in the center and slightly raised at the edges. The lesions are usually split-pea in size and somewhat flattened. They may remain discrete or by confluence dime- to half-dollar-sized crusted patches are formed. The lesions are superficial and without an inflammatory areola. If the vesicle or pustule is broken a denuded, moist, raw-looking surface is observed with a thin watery puriform discharge. The lesions reach the crusted stage in two to five days. When the crusts fall off a reddened surface temporarily remains.

FIG. 104.—Impetigo contagiosa (circinata type).

There may be a few or a large number of lesions present. The lesions may rarely by confluence form segmental, ring-like, or serpiginous patches (*impetigo circinata, impetigo figurata*). Bockhart has recorded a follicular type of the disease.

Impetigo Contagiosa Bullosa.—This variety is found chiefly in young children or in infants, and is characterized by the development of nut- to hen's-egg-size flaccid or tense blebs. These bullous cases may exceptionally occur in an epidemic form in institutions and hospitals (*pemphigus neonatorum*).

The *common variety* of impetigo contagiosa in early life usually attacks the scalp, the face, and hands. In male adults the face,

PLATE VI

Impetigo (Bockhardt).

Courtesy of Dr. M. B. Hartzell.)

particularly the bearded region, other portions of the face, and the neck are most frequently attacked. The *follicular type* of Bockhart tends to involve the hairy parts other than the scalp. The annular and gyrated types involve not only the face but occasionally the arm-pits, the pubic region, and other portions of the trunk. The *bullous variety* has a predilection for the pubic region, the genitalia, and the buttocks, but may be somewhat generalized. The conjunctival, the nasal, and the oral mucous membranes may be attacked, particularly in the epidemic bullous variety. Itching is absent or slight. There may be slight or marked constitutional involvement in the epidemic bullous variety.

Etiology and Pathology.—The disease is contagious and autoinoculable. It is usually observed in early life, although adult males not infrequently acquire the affection, particularly in barber shops. The disease is caused by the Staphylococcus aureus, the Streptococcus, and possibly the Staphylococcus albus. The disease frequently occurs in children secondary to pediculosis capitis.

Histologically the lesions are located between the rete and horny layers, and there is a surrounding mild inflammation. There are found in the central portion of the lesion a large number of the causative organisms.

Diagnosis.—Impetigo contagiosa should be distinguished from other pustular affections attacking the face, particularly acne vulgaris, sycosis vulgaris (non-parasitic), tinea sycosis, and pustular eczema.

Acne Vulgaris.	Sycosis Vulgaris.	Tinea Sycosis.	Pustular Eczema.	Impetigo Contagiosa.
Develops after puberty.	Attacks males after twenty-five years usually.	After the beard has started.	Frequently in children.	Usually only in childhood.
Attacks any portion of face; also not infrequently the shoulders, back and chest.	Limited to the bearded region and mustache area.	Chiefly bearded region, exceptionally mustache.	Any portion of the face or body.	Scalp, face and hands most frequently.
Lesions consist of papules, pustules, blackheads and sebaceous cysts.	Discrete pustules (each pierced by a hair).	Furuncular carbuncular and abscess-like lesions.	Pustules which run together, forming large red, crusted, oozing patches fading into the sound skin.	Vesicles becoming pustular or pustules, discrete, which dry up into honey-colored stuck-on crusts (each lesion running a course of but a few days).
Runs a chronic course.	Lasts months or years.	Lasts for a few weeks to several months.	Runs an acute or chronic course.	Acute course.
No local symptoms; frequently an associated gastro-intestinal derangement.	No local symptoms.	Soreness and tenderness.	Itching.	No symptoms.
	Inflammation around the hair follicles.	Folliculitis, hair loss, broken-off hairs, prominent follicles; fungus microscopically.		

Prognosis and Treatment.—The usual type of the affection is readily cured, lasting not longer than one to three weeks. Bullous impetigo contagiosa (*pemphigus neonatorum*), particularly when it occurs in epidemics, is a rather serious condition. The mucous membrane involvement interferes with the taking of the breast or bottle. The infant takes insufficient nourishment, and death may result. In a hospital epidemic of bullous impetigo contagiosa recently seen, one-third of the infants died.

The best treatment for the common type of the disease consists of an ammoniated mercury salve, 15 gr. (1.) to the ounce (30.) of petrolatum for an infant; or 20 gr. (1.3) for a young child or an adult. Lesions should be kept constantly covered by the application. If necessary, apply the preparation six or more times daily and the last thing before retiring. In a non-hairy part zinc oxide ointment may be used as the base instead of petrolatum. In adults or older children it hastens the cure to mop on thoroughly, not only on the lesions but on the surrounding parts as well, a 1 to 4000 bichloride solution to prevent autoinoculation. Naturally do not apply the lotion over a wider area than the face and scalp. In rare instances the lesions are resistant to these two preparations, and then precipitated sulphur ½ dr. (2.) to the ounce of petrolatum (30.) is indicated, or an ichthyol lotion, 1 dr. (4.) to the fluidounce (30.) of water. In the *bullous variety* of the affection, particularly the epidemic variety, where there are a large number of lesions present and the surface is extensively denuded by the breaking of the bullæ, boric acid, 20 gr. (1.3); bismuth subcarbonate, 1 dr. (4.); petrolatum, 7 dr. (28.), should be freely used. A saturated solution of boric acid is employed generally over the surface to avoid, if possible, autoinoculation.

ECTHYMA.

Definition.—Ecthyma is characterized by the appearance of dime and larger sized pustules with a flattened surface and a surrounding inflammatory areola.

Symptoms.—The lesions in the great majority of cases are found on the legs, usually the lower portion, and occasionally on the buttocks, the shoulders, and the arms. The disease commonly starts as pea-sized pustules which enlarge until they may become one-quarter dollar and occasionally larger in size. The lesions are infiltrated, covered with abundant yellowish, yellowish-brown, or brownish-black crusts, and there is a surrounding red areola. The individual lesion lasts from a few days to several weeks. They may continue to appear over a course of some months. There are usually not more than from one-half to a dozen lesions present.

When the crust is removed, or when it dries up and falls off, superficial ulceration is found and pigmentation remains for a considerable period at the site of attack. The patient may complain of slight itching, burning, tenderness, and pain.

Etiology and Pathology.—The disease is a staphylococcic or streptococcic infection of the skin, possibly through some small break on the surface. It is observed almost exclusively in adult males, of the lowest type, particularly in those who are not only unclean but whose nutrition is poor. It is not infrequently observed as an accompaniment of pediculosis corporis and less often associated with various other animal parasitic diseases of the skin.

Pathology.—The findings are practically the same as in impetigo.

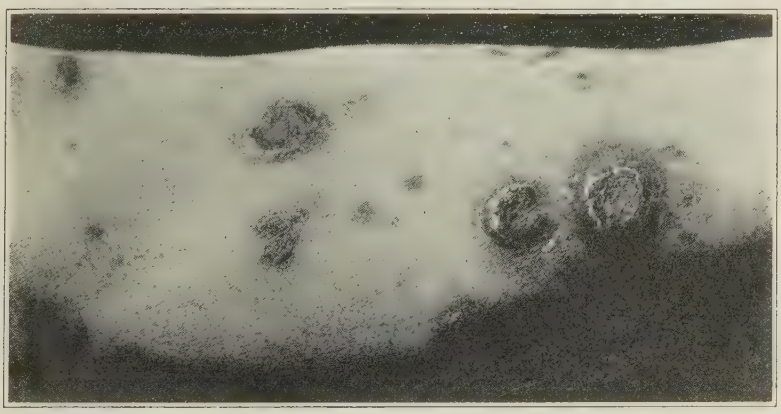


Fig. 105.—Ecthyma.

Diagnosis.—Ecthyma and impetigo contagiosa are varieties of the same disease, the virulence of the staphylococci and streptococci is greater, and the resistance of the individual's skin is less in the former condition, thus accounting for the deep-seated, crusted inflammatory lesions, followed by scarring in ecthyma and the commonly superficial lesions of impetigo contagiosa.

Ecthyma has to be differentiated from syphilis of the flat-pustular type. Syphilis of this variety is in the secondary stage, therefore of a generalized distribution, with the various concomitant signs of the disease, such as pharyngitis, glandular enlargement, possibly pains in the muscles and bones, falling of the hair, anemia, and the presence of mucous patches in the mouth. The pustules are of a dark red color, entirely covered with oyster-shell-like, greenish-yellow crusts. Ecthyma exhibits only a few lesions of a markedly inflammatory type, a different kind of crusting, a red areola sur-

rounding the lesion, a limited distribution, and the absence of constitutional involvement.

Prognosis and Treatment. The disease is readily cured. The patient's hygiene is most important in the cure of the affection. Good, plain, wholesome, easily digested food and clean surroundings are essential. The patient should bathe several times weekly. The clothing should be clean, and as a safeguard against animal parasites, also boiled.

Ammoniated mercury, 20 gr. (1.3) to the ounce (30.) of zinc oxide ointment; or a base consisting of powdered starch, powdered bismuth subcarbonate, each 2 dr. (8.); petrolatum, 4 dr. (15.), is recommended. In cases with markedly raised and very thick crusts, salicylic acid, 10 gr. (0.65) to the ounce (30.), may be added to the prescription just mentioned for its absorptive action.

ORIENTAL SORE.

Synonyms.—Delhi boil; Delhi sore; Oriental boil; Kandahar sore; Pedjeh sore; Natal sore; Aleppo boil; Biskra button; Gassa button; Veld sore, etc.

Definition.—An infectious endemic ulcer or button-like sore.

The affection was first described by Peacock in 1845, who discovered it in Aleppo.

Symptoms.—Three days to one or more months after inoculation, an itching red papule appears which becomes pea or grape in size. The papule is hard, vascular, dull red in color, flattened, scaly, with a crusted and depressed center. The center becomes necrotic, and after some months it tends to break down and forms an indolent, sharply cut, oblong, and irregularly shaped ulcer. The latter eventually heals and a pronounced scar remains. The growth, however, may continue as a scaly or crusted nodule, finally disappearing with the production of an insignificant scar or atrophic mark. The "sore" may be composed of coalesced papules with a papillomatous surface. There is frequently but a single lesion present. The areas usually attacked are the face, the hands, the forearms, and the legs. A fully developed Oriental sore is an inch or more in diameter. There are no constitutional symptoms.

Etiology and Pathology. -The disease is limited to certain tropical countries, Morocco, Algiers, Tunis, Egypt, Crete, Cyprus, the Crimea, Syria, Mesopotamia, Arabia, Persia, Turkestan, India, Brazil, and other portions of South America. It may be observed in travellers and in immigrants from the infected districts. It is usually observed under forty-five years of age and more often in childhood. Oriental sore is contagious, autoinoculable, and transmissible to and from the lower animals by direct contact or by the

medium of insects, articles of clothing, etc. The disease is probably propagated by blood-sucking insects.

Various microörganisms have been found which are thought to be causal. Protozoa (Leishman bodies), for which Wright proposed the name *belcosoma tropicum*, are the probable cause of the affection. These bodies have been found in the blood, in phagocytes. They are found intercellularly.

Sections of the papules show a round-celled infiltration of the derma, multinuclear and giant cells and leukocytes, chiefly in the neighborhood of the bloodvessels and the coil glands.

Diagnosis.—The fact that the disease develops in natives or those living in the tropics, the local character of the outbreak readily differentiates it from syphilis.

FIG. 106.—Oriental sore. (Courtesy of Dr. Howard Fox.)

Prognosis and Treatment.—The prognosis is favorable, except for the resulting scar.

Excision or cauterization has been advocated. Tartar emetic should be given intravenously.

BUCHAREST BOIL.

Finkelstein has described this affection, which has been confused with Oriental sore. Local pain develops with the subsequent development of an elevated nodule which bursts, and after discharging leaves a contracted cicatrix. The abscess may reach the size of a child's head. The affection is accompanied by fever and may be complicated by articular ankylosis. The disease occurs in the inguinal or lumbar region and between the ages of eighteen

and thirty-five years. The general health is slightly or not at all affected. Unsanitary modes of living are supposedly predisposing. The pus contains Fränkel's pneumococci, streptococci, and staphylococci.

GRANULOMA PYOGENICUM.

Synonym.—Botryomycosis hominis.

Definition.—A disease characterized by the production usually of one, at times several, fungating tumors composed of granulation tissue and which result from infection.

Symptoms.—There is usually but one tumor present. The growth is the size of a small pea or olive, exceptionally larger, fungating or pedunculated, bright red in color, covered by a thin layer of horny epidermis or with a raw granular surface. The lesion is very vascular, bleeds readily, and is apt to be tender to pressure.

Etiology and Pathology.—The tumor develops at the site of a small trauma and therefore is most frequently observed on the hands, but any part of the body may be attacked. The cause of the affection is the staphylococcus, probably in all cases the staphylococcus aureus.

Histologically the growth is a granuloma, consisting of granulation tissue rich in bloodvessels, an increased amount of fibrous tissue and numerous pus cocci.

Prognosis and Treatment. The lesion tends to persist and to recur, unless completely destroyed. Excision or thorough cauterization is indicated.

DERMATITIS VEGETANS.

Synonym.—Pyodermatite végetante.

Definition.—A rare affection characterized by the development of variously sized vegetating masses, usually upon and secondary to an eczematous outbreak and resulting from infection.

Symptoms.—The fungating masses are frequently arranged in plaques, of a bright or dark red color, covered by horny epidermis or with a raw granular surface, and accompanied by an abundant discharge of pus and serum, and a considerable amount of crusting. There may be the usual type of eczema present, in addition to the superimposed fungating masses. Discrete tumors usually attack the face and vary from a pea to a walnut in size. The papillomatous plaques may cover a considerable portion of the lower abdomen, the inner sides of the thighs and the genitals. A slight amount of itching and pain may be present.

Etiology and Pathology.—The cause of the affection is a staphylococcic infection, usually the Staphylococcus aureus. In most

instances the disease develops on patches of eczema in those who are uncleanly.

The lesions consist of masses of exuberant granulation tissue, and overgrowth of fibrous tissue and an increase of bloodvessels and numerous staphylococci (Staphylococcus aureus).

Diagnosis.—The history, localized distribution, lack of constitutional involvement, the absence of bullæ and other organisms than staphylococci are the points of differentiation from other cutaneous diseases.

Fig. 107.—Dermatitis vegetans. (Courtesy of Dr. M. B. Hartzell.)

Prognosis and Treatment.—The disease, untreated, runs a course of months or years. Cure is readily effected with cleanliness and mild antiseptic remedies. Temporary pigmentation remains after the disappearance of the outbreak.

The local application in addition to systematic use of soap and water are continuous wet dressings of boric acid, the official boric acid ointment, or ammoniated mercury, 20 gr. (1.3) to the ounce of petrolatum (30.).

DERMATITIS INFECTIOSA ECZEMATOIDES.

Synonyms.—Infectious eczematoid dermatitis; Engman's disease.

Definition.—An acute inflammatory outbreak, characterized by the occurrence of vesicular or pustular lesions, often located on a reddened base. Engman described the disease in 1902.

Symptoms.—The original lesion is usually a small vesicle, which may break and form a crust, or distinct pustules may form. The lesions are usually discrete but in certain instances may coalesce. There may be undermining of the surrounding skin. The eruption occurs in circumscribed patches of moderate size, which increase by peripheral extension. The exposed surfaces are most frequently attached. The disease is frequently secondary to an irritant dermatitis, sometimes one of long standing.

Etiology.—The disease appears more frequently in adults than in children, and in the male sex rather than in the female. Engman found the Staphylococcus albus or aureus caused the outbreak and that infection was probably through breaks in the skin caused by trauma.

Pathology.—The horny layer is undermined and detached. There is present a slight acanthosis, edema and minute abscess of the prickle-cell layer, swelling and congestion of the papillæ, with an associated perivascular infiltration.

Diagnosis.—The patches are more marginated and the vesicles are not so closely placed and are larger than those seen in eczema. The outbreak is not limited to the hairy portions of the face as is a sycosis. Impetigo contagiosa is more frequently observed in childhood and there is not the tendency to form spreading patches. In ringworm spores and mycelium threads are readily found.

Prognosis.—The disease usually responds favorably to treatment but occasionally may prove difficult to eradicate. Recurrences are not infrequent.

Treatment.—A 2 to 4 per cent ammoniated mercury ointment is usually helpful. Cole recommends a 1 per cent solution of potassium permanganate. An autogenous vaccine may be necessary.

FURUNCLE.

Synonyms.—Furunculus; Boil.

Definition.—An acute circumscribed inflammation of the hair follicle with central necrosis and suppuration.

Symptoms.—The boil starts as a painful, indurated, slightly raised, reddish, or purple-red spot. The central portion becomes elevated, forming a convex tumor, and the induration spreads peripherally. Later the central portion softens and becomes yellow, while the surrounding skin is red and densely infiltrated. The epidermis covering the center of the furuncle finally breaks and pus is discharged through the irregularly shaped opening. The deepest portion of the boil is known as the core. It is spindle-shaped and consists of yellowish-gray necrotic tissue. After the lesion breaks, fragments of the core are discharged until the entire

mass is exuded. The symptoms subside rapidly with the elimination of pus. The process is at times checked before the suppuration occurs and resolution occurs without actual necrosis. This is designated a "blind boil" and does not progress beyond the stage of painful inflammatory induration.

Furuncles are frequently exceedingly painful and there may be considerable constitutional disturbance.

The neighboring lymphatic glands may be enlarged, tender, and at times suppurate. Boils occur singly or in crops, coming out for several weeks or months. The areas usually attacked are the neck, the face, the forearms, the legs, and the buttocks. In most instances they reach full development in from three to six days. Boils attacking the sweat glands have been termed by Verneuil *hydradenitis distrueus suppurativa.*

The inflammation around the central portion of the lesion shuts off the blood supply and associated with the liquefying action of the leukocytes and cocci causes the breaking down and production of the core mass.

Diagnosis.—Furuncle is distinguished from a carbuncle by the fact that there are frequently several present and there is but a single opening; the carbuncle is usually single and with several openings.

Prognosis.—Boils usually suppurate in from three to six days, and run a course of from one to three weeks. New lesions are apt to appear more or less continuously or separated by days, weeks, or months.

Treatment.—Constitutional treatment is directed toward placing the patient in the best possible health and treating any underlying predisposing condition. Several internal remedies have been exploited as proving directly helpful, none of which in my hands have given any marked benefit. Calcium sulphide has been given every three to four hours in $\frac{1}{10}$- to $\frac{1}{5}$-gr.-doses (0.006 to 0.012). Fresh brewers' yeast has been administered in teaspoonful to tablespoonful doses three times daily.

Individuals who are subject to furuncles should start treatment with the slightest sign of a red, infiltrated, slightly painful spot. There is no better preparation to abort these lesions than a 25 per cent ichthyol ointment. In order to get the desired result the preparation has to be thoroughly and continuously rubbed into the lesion for not less than five minutes, and ten is even better, twice daily, night and morning. In the meantime the beginning boil is either dressed with this same preparation or covered with ichthyol plaster. This treatment is of use in every case up to the stage of suppuration, when free incision and drainage are indicated. With several boils on the back of the neck, further autoinocula-

tion should be prevented, if possible, by thoroughly mopping over the contiguous parts a 1 to 4000 bichloride of mercury lotion. In the event of eight to ten furuncles being present at one time the treatment inaugurated by Bowen has proved most successful with me. He suggested that a considerable portion of skin beyond and including the boils should be bathed with warm water and soap, then with a saturated solution of boric acid, and following that an ointment consisting of phenol, 10 minims (0.65); boric acid, 1 dr. (4.); precipitated sulphur, 1 dr. (4.); petrolatum, 6 dr. (24.), is rubbed into the lesions twice daily. This method aborts some of the early lesions and tends to prevent autoinoculation. If the boil is very deep-seated, slow in developing a pustular head, and with marked induration, incision helps to relieve the tension, even if the pus is not fully developed, and Bier's cup helps to relieve the pain, causes an increased blood supply to the part, hastens the flow of pus, and therefore hurries the healing process. The cup should be applied easily at first and the skin only slightly drawn up. If the boils are more or less scattered over the surface of the body, Bowen's salve is of use, or, particularly in the summer furuncles of children associated with *miliaria*, a lotion of ichthyol, ½ to 2 dr. (2. to 8.); boric acid, 15 gr. (1.); powdered zinc oxide, ½ dr. (2.); lime-water, 1 fl. oz. (30.), may be freely and frequently applied.

Vaccine treatment of furunculosis is chiefly applicable to recurrent cases of the affection or where there are a considerable number of lesions present. In the latter event an initial dose of 250,000,000 killed organisms is given, and it is doubled at the next injection and again at the third, and the latter dose successively repeated until there is a clinical response. The first two injections are given five days apart and subsequent treatment every seven to ten days. After the outbreak is conquered by this method, smaller injections of 75,000,000 to 100,000,000 are given every ten days. If the boils have been recurring every two weeks, continue the treatment for three months to prevent a relapse, when at intervals of two or three months the preventive injections are given for twice that period. When the furuncles tend to appear at certain seasons each year it is well to start the vaccine treatment before that period as a prophylactic measure. Vaccines may be prepared from the patient's lesions, or stock vaccines containing mixed staphylococcic organisms may be used.

Recurrent furuncles on the posterior surface of the neck near the collar line are frequently very resistant to treatment. The individual should apply, twice daily, a bichloride lotion (1 to 4000) or a solution consisting of boric acid, 15 gr. (1.); resorcin, 10 gr. (0.65); salicylic acid, 8 gr. (0.5); alcohol, 1 fl. oz. (30.); dilute if

too strong. The hair on this area should be shaved. Rubbing of the clothing on this area should be prevented so far as possible, and roentgen-ray exposure may be given.

CARBUNCLE.

Definition.—A carbuncle is an acute phlegmonous inflammation of the skin and subcutaneous tissues terminating in necrosis which discharges through multiple openings.

Symptoms.—The process starts with circumscribed flattened red induration of the skin and the subcutaneous tissues which gradually increase in size, in certain instances having the dimensions of the palm of the hand. The affected area becomes of a dark red or purple color and board-like to the touch. After increasing steadily for a week or more small pustular points develop on the surface of the mass, which rupture and discharge blood and purulent material. The underlying slough may be discharged through these several openings, or the entire surface covering is discharged with the necrosed center and an irregular-shaped deep-seated ulcer remains, which heals by granulation. A permanent scar remains at the site of the lesion. The pain accompanying a carbuncle is very severe, and there may be high fever and great prostration. There is usually but one lesion, which is located in most instances on the nape of the neck, the shoulders, the face, or the abdomen.

A carbuncle usually reaches maturity in from eight to ten days, and the slough may separate and healing occur within two weeks, or it may run a course of from five to six weeks in severe instances.

Rarely the carbuncle does not point but remains boggy. In severe instances the surface of the lesion may become gangrenous.

Etiology and Pathology.—The cause of the affection is the invasion of several contiguous follicles by staphylococci. The predisposing causes are practically the same as in furuncle, only acting more intensely.

The pathology is essentially that of furuncle, excepting for its intensity and the numerous points of infection.

Diagnosis.—Carbuncle is differentiated from furuncle by the severity of pain, marked constitutional symptoms, the greater involvement of tissue, and its multiple points of necrosis and discharge.

Prognosis.—Carbuncle is a serious condition, particularly in the aged, in those with diabetes, and when of considerable extent. When the upper lip, cheek, or scalp are attacked it is particularly dangerous because of sepsis, thrombosis, embolism, and the spread of the infection to the meningeal vessels.

Treatment.—Exceptionally, in the very beginning, the carbuncle can be aborted by keeping the surface soaked in a 5 to 10 per cent carbolic acid solution or a 50 per cent solution of ichthyol. Although thorough injection of carbolic acid in glycerin or oil, 10 per cent in strength, has been exploited, early surgical interference is recommended, either several thorough incisions or the excision of the entire inflammatory mass.

GAYLE.

Crocker describes an affection characterized by the production of a flat-chambered vesicle or bleb, with a slightly depressed center, a centimeter or more in diameter, of a bluish-gray color, with an inflammatory areola, and containing clear or blood-stained serum. The lesion develops on the hand. The hand is swollen and there is apt to be axillary adenopathy. There may be pain and mild fever. The disease is caused by inoculation of the Staphylococcus hemorrhagicus, following the skinning of ewes which have died of a puerperal disorder in the lambing season. A lotion containing bichloride of mercury is curative.

ERYSIPELAS.

Synonym.—St. Anthony's fire.

Definition.—An acute streptococcic inflammation of the skin and subcutaneous tissue characterized by redness, swelling, edema, heat, and accompanied by slight or marked fever.

Symptoms.—Erysipelas may begin with intense chilliness or a distinct chill, nausea, sometimes vomiting, and fever, which precede the cutaneous outbreak by a few hours, a day or more, or the eruption may in mild cases begin without previous symptoms. One or more red spots appear at the site of infection. They become confluent and form a swollen, large, red, inflammatory, irregularly shaped, sharply marginated patch that is tense, smooth, glistening, and elevated in temperature. As the inflammation becomes more intense the patch grows dark, angry red in color, the swelling increases, the surface is more glazed in appearance, and vesicles and bullæ filled with clear yellow serum develop on the affected area.

The inflamed lymphatics leading from the patch of erysipelas radiate, in certain cases, as red lines to the contiguous glands, which become enlarged and tender and the deep lymphatics may feel like large cords. Where the subcutaneous tissue is lax, as in the eyelids, there is great swelling and the eyes may become completely closed. After a patch has reached a certain development it may remain stationary, but in most instances it tends to spread at the border, the older portions involuting.

Erysipelas may attack any portion of the cutaneous surface. The face, particularly in the neighborhood of the nose, and the head are most often involved.

The incubation of the disease varies from fifteen to sixty hours (Fehleisen). The inflammatory process reaches its height within a few days after its onset and then begins to subside. The swelling gradually lessens, the redness decreases, the color becomes brownish-red, then yellowish, and finally the patch disappears with more or less desquamation. Where bullæ have been present they dry into crusts and the dead epidermis is thrown off. Relapses frequently occur. Subjective symptoms of burning, slight itching, pain, and tenderness, vary according to the severity of the attack.

In moderately and markedly severe cases there is high temperature during the attack which increases at night. The pyrexia falls rapidly with the subsidence of a moderate attack and slowly in the severe cases. In severe instances the temperature remains quite high, 103° to 105° F., through the attack. The spread of the disease to the deeper tissues is indicated by a greater elevation of temperature. There are frequently gastro-intestinal symptoms, a dry, brown and furrowed tongue, sores on the lips, and the patient may pass into a "typhoid" condition. In severe instances vomiting and delirium may occur; the urine may contain albumin and casts.

Variations and Complications.—The disease may appear on one portion of the body and rapidly subside, reappearing in another region, and thus continuing for some weeks (*erysipelas migrans*). Rarely and in grave cases the bullæ formed on the patch of erysipelas may become hemorrhagic, or the process is so intense that gangrenous areas develop. Certain individuals seem to be unusually susceptible to the streptococcic infection and attacks of erysipelas, usually mild in character, appear frequently over a course of months or years. As the result of repeated attacks of this affection, persistent localized lymphangitis, usually located on the upper lip, at times on other portions of the face, characterized by persistent enlargement, are observed. Elephantiasis, as a result of the obstruction of the lymphatics, may develop. Diffuse suppurative lymphangitis, as the result of staphylococcic infection, particularly in cases with bullæ formation, supervene during an attack. During the subsidence of erysipelas, boils and superficial abscesses may develop. The disease may spread to the mucous membranes of the nose, mouth, pharynx, rectum, or vagina. There may be ulceration or gangrene of the fauces and contiguous tissues, and also obstructive edema of the larynx, meningitis, and sinus thrombosis. The Eustachian tube, the middle ear, the eyes, and very rarely the lungs and esophagus, have shown involvement.

Etiology and Pathology.—The cause of erysipelas is inoculation through an abrasion of the skin or an adjacent mucous membrane, at times so minute as to be undiscoverable, or of wounds, burns, scalds and the like, of the Streptococcus pyogenes, or as exploited by Fehleisen, a specific streptococcus. The lower resistance of the tissues is a contributing factor. The disease most often occurs in middle life. Certain individuals are particularly prone to an outbreak. Causes which predispose by lessening the resistance of the individual are chronic alcoholism, lack of cleanliness, and trauma.

Streptococci are found free in the lymph spaces, in the connective tissue, in blebs, but are most active in the spreading border of the patch. They are not found in the blood or bloodvessels, excepting in rare instances of Streptococcic septicemia.

Diagnosis.—The sharp margination of the patch, the glazed surface, the acute onset and the fever distinguish the condition from eczema or dermatitis; eczema does not have the sharp margin to the patch, the constitutional involvement, and is accompanied by intense itching.

Prognosis.—The prognosis depends upon the severity of the symptoms, the extent of the disease, the condition and age of the patient. Even in severe uncomplicated cases recovery occurs. A fatal result frequently occurs in the very young or in the aged. Death results from toxemia, from exhaustion in prolonged cases, from invasion of deeper structures than the skin, or from organic complications.

Treatment.—The two preparations which have been most frequently prescribed in erysipelas are the tincture of the chloride of iron in 15- to 40-minim doses (1. to 2.6), and quinine in 2- to 5-gr. doses (0.12 to 0.3), each three times daily. Strychnine sulphate, $\frac{1}{30}$ to $\frac{1}{20}$ gr. (0.002 to 0.003), three or four times daily, may be indicated as a supportive measure. In instances of severe depression alcoholic stimulants may be indicated. In severe instances streptococcic vaccine, preferably autogenous, is recommended, 5,000,000 organisms being given; subsequent injections are administered at intervals of five days. Locally the three preparations which I have found most efficacious are a saturated solution of boric acid, a saturated solution of magnesium sulphate, and ichthyol lotion or ointment. In the treatment of mild cases boric acid or magnesium sulphate are equally effective.

Personally, I am inclined to use in the mild cases the following prescription: Ichthyol, 2 dr. (8.); boric acid, 1 dr. (4.); powdered zinc oxide, $\frac{1}{2}$ oz. (15.); glycerin, 40 minims (2.6); liquor calcis, 4 fl. oz. (120.). In those slightly more severe the ichthyol is

increased to ½ or 1 oz. (15. to 30.) to the above mixture. In those of greater severity an ichthyol ointment is prepared, consisting of ichthyol, 2 dr. (8.); powdered zinc oxide, 2 dr. (8.); petrolatum, 4 dr. (15.). In using the ointment it should be gently but thoroughly rubbed in, particularly at the spreading edge, for five minutes, night and morning, and in addition, freshly applied twice daily. The border of the patch and the sound skin just beyond may be painted with tincture of iodine.

KERATOSIS GONORRHEICA.

Synonym.—Keratosis blenorrhagica.

Definition.—A rare affection characterized by symmetrical keratoses on the soles of the feet and palms occurring with gonorrhea. The condition was first described by Vidal in 1893.

Symptoms.—Two varieties of the affection have been described: A localized form limited to the hands and feet, particularly the palms and soles, and a somewhat generalized variety which attacks chiefly the legs and forearms, at times the arms and thighs, and rarely the face and scalp. The localized type of the disease is the one most often observed. The epidermis on the affected parts is thickened and has a yellowish-brown parchment-like appearance. The lesions consist of waxy, translucent-looking, horny, uneven projections, or brownish crusts. Dark brown or purplish nodules, 0.3 to 2 cm. in width, with an encircling hyperemic areola, are also present. The lesions feel like horn and no fluid can be withdrawn on puncture. When involution of the lesion occurs the horny masses peel off, leaving reddish-brown stains. The course of the disease is about three months.

Etiology and Pathology.—The disease occurs only in association with severe gonococcal infection, with severe arthritic and other symptoms. It is therefore directly or indirectly caused by the gonococcus.

The nodules are covered with a thick horny cap and the stratum granulosum and Malpighian layers are infiltrated with neutrophilic leukocytes. In addition there is edema of the papillary layer and an infiltration of lymphocytes and plasma cells about the vessels.

Diagnosis.—The preceding or accompanying gonorrhea, the gonorrheal arthritis, and the associated symmetrical keratoses make a characteristic picture.

Prognosis and Treatment.—Proper treatment toward the gonorrhea, particularly vaccine injections, causes total disappearance of the outbreak in about three months (Sequeria).

B. DISEASES CAUSED BY BACILLI.

CHANCROID.

Synonyms.—Ulcus mollis; Soft chancre.

Symptoms.—Two or three days after infection a small vesico-pustule appears which rapidly develops into an excoriated plaque or superficial ulcer, usually the size of a dime. The edges are slightly elevated and at times fissured. The floor of the lesion is covered with a grayish-yellow or greenish material, and exudes an abundant purulent secretion. The lesion is soft, without induration, and is surrounded by a red, slightly swollen areola. Autoinoculation usually occurs and multiple sores of the same size or smaller dimensions are commonly present. The prepuce, glans, and frenum are the sites of predilection in the male. The female, in most instances, shows the outbreak in the vestibule, the labia minora, the clitoris, and on the fourchette. Lesions by autoinoculation are also observed in the anal and pubic regions, in the gluteal cleft, and on the inner surface of the thighs. The neighboring lymphatic glands may be swollen, painful, tender, and tend to suppurate. The buboes thus formed are of large size, and by rupture may produce an ulcer with fistulous tracks. Rarely phagedena and gangrene may result from mixed infection.

Etiology and Pathology.—The cause of the disease is inoculation with the streptobacillus of Ducrey. Inoculation is almost always produced at the site of a small abrasion or herpetic sore with the pus from a like lesion during coitus.

The parasite is a short bacillus with rounded ends, often occurring in chains. There is destruction of the epidermis and part of the dermis, with a plasma-cell infiltration and inflammation of and around the vessels.

Diagnosis.—Chancroid (soft chancre) has to be differentiated from the hard chancre of syphilis. The indurated sore appearing three weeks after inoculation, the non-inflammatory glandular enlargement, and the subsequent generalized eruption should clearly differentiate the initial lesion of syphilis from the soft sore (chancroid), with a short incubation period, the autoinoculated lesions, and the inflammatory glandular enlargement. The finding of the Spirochæta pallida in the syphilitic lesion and the Ducrey streptobacillus in chancroid is conclusive proof of the diagnosis.

Prognosis and Treatment.—The prognosis is favorable, although frequently strong applications are indicated.

Cauterization is usually the quickest method of cure. Acid nitrate of mercury applied to the sore is curative. Instead of cauterization, a dusting powder containing salicylic acid, 20 gr.

(1.3); calomel, 40 gr. (2.6); boric acid and powdered talcum, each ½ oz. (15.), is of use. Frequent washing with soap and water and the application to the surrounding parts of a bichloride solution, 1 to 2000, is useful in preventing autoinoculation. The inflamed glands may be dressed with a 25 per cent ointment of ichthyol or an ointment containing equal parts of the official ointments of mercury, belladonna, ichthyol, and lanolin. The glands frequently have to be opened and curetted.

VERRUGA PERUANA.

Synonyms.—Peruvian warts; Oroya fever; Carrion's disease.

Definition.—A specific inoculable disease, endemic in certain valleys of the Peruvian Andes, and characterized by prodromal fever, which is followed by wart-like growths on the skin.

The affection was first mentioned by Zarate in his *History of the Conquest of Peru* (1543), and subsequently scientifically described by J. J. Tschudi in 1845.

Symptoms.—The first manifestations of the disease consist of severe rheumatoid pains and fever, which may last for weeks or months, and is frequently of an intermittent character. Grave anemia develops, accompanied by changes in the spleen and liver, and often profound prostration and intermittent chills. In grave instances death may result before the appearance of the cutaneous outbreak.

The eruption is characterized by the development of a few or many discrete or confluent, slightly elevated, pinkish or reddish macules, which later become a dusky, bluish-red hue. Subsequently these lesions become wart-like from pea to bean, exceptionally pigeon-egg in size, soft or elastic in consistency, smooth or rough, shiny and often hemorrhagic. In certain instances vesico-pustules and even large blebs are also present. There may be a few or thousands of fully developed lesions. The areas usually attacked are the face, the neck, and the extensor surface of the legs in the neighborhood of the articulations, but the outbreak may be somewhat generalized. The palms, the soles, and the scalp are commonly free, and the trunk is rarely attacked. The lesions may involve the subcutaneous tissue, the mucous membranes, and also the viscera. The lesions, in certain cases, become confluent, and deep ulcers develop with a fetid, hemorrhagic discharge. In such instances, malignant-looking grayish or blackish spongy masses, covered with brownish crusts and emitting a noxious odor, are observed.

Etiology and Pathology.—The disease is limited to certain valley districts of the Western Andes in Peru, or to infected immigrants

from that area. It is inoculable, as demonstrated by Dr. Carrier, who perished from a self-inoculation. It is apparently due to a bacillus somewhat larger than the tubercle bacillus (Yzquierdo). This bacillus is found not only in the tissues of the tumors but in the bloodvessels.

The tumors are composed of highly vascular granulation tissue. The central portion of the structure of large tumors resemble a cavernous angioma.

Prognosis and Treatment.—The disease ends fatally in about one-sixth of the cases. Removal of the patient to a climate where the disease is not endemic is advised.

TUBERCULOSIS OF THE SKIN.

Tuberculosis of the skin is divided into those cases directly caused by the action of the tubercle bacillus in the skin and those presumed to be due to the action of tuberculous toxins circulating in the blood. The former shows a characteristic arrangement of infectious granuloma. The inoculation of guinea-pigs produces tuberculosis, and the various tuberculin tests are positive. The latter group, the so-called tuberculides (Darier) or paratuberculoses (Johnston), are not tuberculous deposits in the skin but are inflammatory lesions which are attributed to the influence of tuberculous toxins present in the blood or to attenuated forms of Koch's bacillus.

Clinical Tests for Tuberculosis.—An individual with tuberculosis has a hypersensitiveness of his tissue cells to the poisons of the tubercle bacillus, *allergie,* as termed by von Pirquet; therefore, when tuberculin is brought in contact with various portions of the body reaction occurs. The tuberculin tests employed are the *conjunctival test* of Calmette and Wolf-Eisner; the *scarification method* of von Pirquet; the *inunction test* of Moro, and the oldest and most reliable *injection* procedure.

Eye Test.—A 0.5 per cent solution of tuberculin is used in most cases, at times 0.75 per cent or occasionally in children under two years, 0.3 per cent solution. A capillary tube is employed; both ends are wiped off with alcohol and then broken by the fingers covered with sterile gauze; a rubber bulb is then slipped over one end to expel the contents. The lower lid of one eye is drawn downward and one drop of the solution is placed in the lower inner portion of the conjunctiva. The lid is held in this position, allowing thorough diffusing of the solution throughout the conjunctival sac. The reaction develops in from four to twenty-four hours, and is shown by an injection of the palpebral conjunctiva, semilunar fold, caruncle, and orbital conjunctiva. There is usually lacrimation and moderate fibrinous or fibropurulent exudation, which may go

on to profuse suppuration, with marked swelling of the external and internal tissues of the eye. The height of the reaction is usually reached in twenty-four to forty-eight hours, and several days may elapse in severe reactions before the eye becomes normal. It is not to be recommended because of possible complications to the eye.

Scarification Test.—The upper arm is thoroughly cleansed with soap, water, and alcohol, and three-minute scarifications, just deep enough to draw a small quantity of serum, are made at short distances apart. One drop of a 10 per cent solution of tuberculin (0.01 cc containing 0.001 gm. of tuberculin) is then placed on the upper and lower scarifications by means of a sterile dropper and gently rubbed in. One drop of the same solution without the tuberculin, or nothing, is placed on the central scarification to act as a control. The arm is exposed until the solution dries. This test gives its reaction in from five to twenty hours, reaching its maximum in from twenty-four to seventy-two hours. A pinkish to rose-red areola is observed surrounding the excoriations. The central zone may be elevated, indurated, and in severe reactions minute vesicles may be present. The reaction persists for from four days to two weeks.

Inunction Test.—An ointment containing 10 per cent of Koch's old tuberculin is gently rubbed into a small area on the abdomen in the epigastric or mammary region. A finger cot or a rubber glove is employed in this manipulation. An area of sound skin is selected and there is no preliminary disinfection of the surface. On another portion of the abdomen lanolin without the tuberculin is rubbed into the integument as a control. The surface may be exposed to the air for twenty minutes and the excess of ointment is allowed to remain on the skin. A less prolonged exposure to the air and the removal of the excess of ointment limits the reaction to a smaller area. The response to the ointment test manifests itself in from ten hours to three days by the development of a papulo-vesicular outbreak at the site of the application; from one to several hundred lesions develop. The lesions vary in diameter from 0.5 to 4 mm., are of a pinkish color, with or without an erythematous areola. The lesions may persist for several weeks and may or may not be followed by desquamation of the affected area.

Injection Method.—The injection of Koch's old tuberculin causes a general and local reaction. The patient's temperature is taken several times before the injection is given to ascertain if any febrile condition is present. The injection is made between the shoulders or into the buttock, preferably in the early evening; $\frac{1}{10}$ mg. is given, and if there is no reaction $\frac{1}{3}$ mg. is administered three days later. The injections may be administered, increasing the dosage, until

the maximum of 10 mg. is given for an adult; not larger than 5 mg. for a child. During the test the patient is kept at rest and on a light diet. A temperature elevation of 1° F. or higher shows a positive reaction. The local reaction is shown by swelling and erythema of the cutaneous lesion, thus proving the presence of a tuberculous focus.

Tuberculosis of the Skin is divided into *tuberculosis cutis* and *eruptions probably caused by the toxins of the tubercle bacillus.*

Tuberculosis Cutis is divided into *lupus vulgaris, tuberculosis verrucosa cutis, tuberculosis cutis orificialis, miliary tuberculosis and scrofuloderma.*

FIG. 108.—Lupus vulgaris. Patient, aged twelve years. Duration, seven years.

Eruptions Probably Caused by the Toxins of the Tubercle Bacillus are *erythema induratum, lichen scrofulosorum, acne scrofulosorum, folliclis, acnitis, benign sarcoid tumors, hypodermic sarcoids, multiple benign sarcoid.*

Lupus Vulgaris.—Definition.—A chronic cellular infiltration of the skin caused by the tubercle bacillus, and characterized by deep-seated, variously sized, soft reddish-brown tubercles, which form patches and nodules by their coalescence and which either ulcerate or atrophy, leaving scars.

PLATE VII

Lupus Vulgaris.

Symptoms.—The disease begins with the development of several pin-head- to small pea-sized, deep-seated, brownish-red or yellowish grouped macules. New lesions appear and the growths run together, forming variously sized patches. The disease spreads peripherally by the acquisition of new tubercles at the spreading circumference or by the running together of nearby patches. The individual lesions are soft in consistency, and upon pressing all of the red color out by means of a glass slide the deep-seated yellowish growths

FIG. 109.—Lupus vulgaris of the upper arm and verrucous tuberculosis of the nose. (Courtesy of Dr. C. N. Davis.)

can be seen in the depth of the corium. Hutchinson aptly resembled the lesion to a speck of "apple jelly" imbedded in the skin. These nodules in the beginning may be slightly depressed or level with the skin. They may persist for weeks or months without change or undergo fatty degeneration and become absorbed without ulceration, leaving at their site shiny, wrinkled, white scars. In most instances the patches sooner or later break down into indolent, irregularly shaped ulcers, with flat, flabby borders and an unhealthy

red granular floor covered with purulent secretion and dirty greenish-yellow crusts. The ulcerated areas tend to heal spontaneously with the formation of thin, white, smooth, or fibrous scars. The disease tends to again develop in the scar tissue.

There is frequently but a single patch of lupus present, or there may be one or more groups of closely aggregated but distinct tubercles, or separate and grouped patches of lesions may exceptionally be widely distributed over the body (*lupus disseminatus*). The lesions commonly coalesce into nodular plaques of a dull brownish-red color, and having a sharply elevated, firm, nodular border and a softer, depressed nodular somewhat involuted center or a central ulceration.

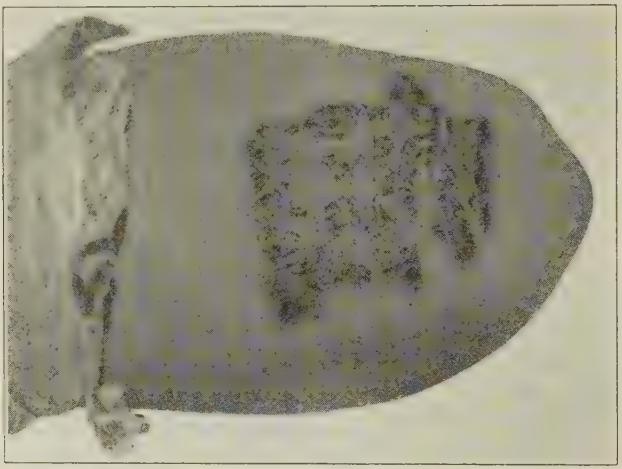


FIG. 110.—Lupus vulgaris. Woman, aged twenty-two years. Started in childhood.

Certain forms of lupus vulgaris are characterized by a tumor formation consisting of heaped-up masses of nodules (*lupus hypertrophicus*), others by great thickening of the tissues with lymphatic obstruction, edema and excessive overgrowth of connective tissue (*lupus sclerosus*). Secondary pus infection may give rise to exuberant granulation tissue and a papillomatous surface to the lesions (*lupus papillomatosus* or *lupus verrucosus*). The tubercles may form an annular patch with central involution (*lupus annularis*), or there may be some scale formation (*lupus exfoliativus*). Patches may rarely be very superficial and resemble markedly, excepting for a few typical nodules in the border of the patch, erythematous lupus (*lupus vulgaris erythematoides*).

The face, particularly around the tip of the nose, is the usual

seat of attack. The disease not infrequently develops on the forearms, the legs, the buttocks and the outer surface of the thighs. Any portion of the body may be involved, but the scalp, the palms, the soles, or the genitals rarely show involvement.

There is usually but one patch present, very frequently two or more, and occasionally plaques are widely distributed.

The disease tends to spread very slowly. It may require many years for a palm-sized area to develop. It may remain almost stationary for months or years and activity may again begin. The lowered condition of the patient's health and external irritation hasten the growth.

Mucous Membrane Involvement.—According to Finsen the mucous membranes of the nose or mouth are involved in 70 to 80 per cent of the cases treated in Copenhagen. Beuller in a synopsis of 380 cases found mucous membrane involvement in 45.5 per cent; in 6 of these it involved these alone, and in 46 it has apparently started at this site. The lesions on the nasal and oral mucous membranes are usually indolent granulating ulcers which readily bleed; rarely, however, they may have the form of primary pinhead or larger sized reddish tubercles covered with a silver-gray epidermis or dull, grayish plaques. The lesions may appear as fungating ulcers with a papillary overgrowth. The mucous membrane of the nose may be attacked primarily or secondarily from the adjacent skin; chronic ulcers are present which may perforate the cartilaginous septum. The tongue is rarely attacked. Lupus usually attacks the conjunctiva secondarily by extension from the cheek or exceptionally through the lacrimal duct. There may rarely be perforation of the eye, secondary to lupus of the cornea, panophthalmitis and loss of the eye. Lupus in exceptional instances has caused perforation of the drum membrane of the ear because of the spread of the disease through the external auditory canal. The disease may also be transmitted through the Eustachian tube. Other mucous membranes which may be attacked are the hard and soft palate, the lips, the larynx, the pharynx, the rectum, and the vulva.

Lupus vulgaris may, if extensive and of long duration, cause destruction of the skin, the cartilages, and rarely the bones. The scar formation following the ulceration may make the patient a horrible looking object.

The subjective symptoms are usually mild or absent. The ulcerative lesions may be somewhat tender, with practically no pain unless there is extensive destruction. In extreme instances there may be anemia and some cachexia.

Complications.—Pus infection of the lesions is of rather common occurrence and attacks of erysipelas are not uncommon. Bone

and joint tuberculosis are observed, pulmonary complications also; and, at times, visceral tuberculosis. In about 2 per cent of cases epithelioma develops on an old lupus patch.

Etiology and Pathology. -Lupus in this country is of uncommon occurrence. Most of the cases seen are localized and the patch or patches are comparatively small. It is, however, prevalent in Great Britain and on the continent of Europe. Although no class is exempt, it is more often found among the poor. Almost two-thirds of the cases have been observed in women. About one-half of the cases begin under ten years of age, and almost one-third under five. The cause of the infection is the invasion of the skin by the tubercle bacillus, a weakened resistance on the part of the patient assisting. A family history of tuberculosis can be determined in approximately one-third of the cases, and in about two-thirds of all cases past or present evidences of tuberculosis existed in the patient.

The tubercle bacillus enters the skin in one of the following ways: By direct inoculation from without; indirect inoculation by contiguity from deep tuberculous foci; inoculation by way of the lymphatics or veins passing through a tuberculous focus more or less remote; infection through the blood; infection by inheritance (Leloir). The first two are probably the common sources of the infection.

Lupus is apt to develop in those in poor physical condition, at times following measles and at sites of trauma.

Tubercle bacilli are found in very scant numbers in sections of lupus. Occasionally it may be necessary to examine a large number of serial mounts before even a single bacillus is discovered.

Histologically, the disease begins in the lower portions of the corium and extends upward. There is, first, an accumulation of cells about the capillaries and lymph channels. The typical lupus nodule consists of small round cells at the periphery of the growth; next, of larger epithelial cells, each with a clear nucleus, and in the middle, giant cells with a homogeneous center and peripherally arranged nuclei. There are fewer epithelial cells and a larger number of giant cells than in the classic tubercle attacking other structures than the skin. The symmetrical arrangement of these three elements is only occasionally met with in lupus. One or the other may be absent or constitute the greater part of the growth. The giant cells are usually large, well developed, and contain from 10 to 100 nuclei. The central portion of the nodule tends to degenerate and undergo coagulation necrosis. The overlying epidermis becomes stretched and thinned; in a considerable number of cases rupture and ulceration result. Tuberculin tests are positive, and guinea-pigs inoculated with the diseased tissues develop tuberculosis.

Diagnosis.—Lupus vulgaris has to be differentiated chiefly from nodular syphiloderm, nodular epithelioma and lupus erythematosus.

Lupus Vulgaris.	Nodular Syphiloderm.	Epithelioma.
Begins in early life.	Middle or early adult life.	After forty years.
Very slow in growth.	Rapid.	Moderately rapid.
Lesions are grouped and consist of patches of yellowish-red or reddish-brown deep-seated soft nodules.	Dark red nodules arranged in the shape of a segment of a circle, serpiginous outline, kidney-shaped.	Ulcer with a rounded, rolled, pearly border; bleeds easily.
Even with skin or only slightly elevated; one or more patches.	Frequently several patches.	Usually one lesion.
Frequently is associated with other tuberculous conditions; tuberculin tests positive.	History of disease, old scars of typical formation; Wassermann test positive.	History frequently of previous wart, mole, pigment spot or trauma.
Scar of no characteristic shape.	Scar typical shape.	No characteristic shape.

Lupus Vulgaris.	Lupus Erythematosus.
Early life.	Early adult life.
Slow course.	Reaches its development in a few weeks or several months.
Typical lesion is deep-seated yellowish-red or reddish-brown nodule.	Slightly elevated pinkish patch, with fine white scale and widely open follicles on surface.
Frequently one or two patches.	Usually several symmetrically arranged plaques.
Deep-seated.	Moderately infiltrated.
Ulcerated; tuberculin tests positive.	Does not ulcerate but may cause atrophy without scar formation; tuberculin tests negative.

Prognosis.—Lupus is a rebellious disease to treat and therapeutic measures frequently have to be carried out over months and years in extensive cases. The possibility of general tuberculosis or of phthisis following lupus is to be remembered; according to Leloir the latter occurred in 21 per cent of his cases.

Treatment.—Treatment aims at placing the patient in the best possible physical condition and the destruction or removal of the tubercle bacilli in the skin with the least injury to the intervening and surrounding integument. In addition to good nourishing food, cod-liver oil, iron, quinine, strychnine, etc., it should be tried to raise the resistance of the individual against the invading organism by vaccine treatment.

The new tuberculin—tuberculin T. R.—or old tuberculin may be injected in $\frac{1}{2}$ mg. doses, and this increased by the addition of

2 mg. to each subsequent dose. The attempt is made to produce a reddening of the lesion and only a slight general reaction, an elevation in the temperature of not more than 1° F.

Small doses, if causing but a slight reaction, may be repeated every two days. In administering large doses the interval between injections should be much longer, and in the event of an acute reaction it should be allowed to subside before the injection is repeated.

The best local means of treatment are excision, if the patch is not too large, the Finsen light, radium, and the roentgen-rays. In excising a patch of lupus the excision has to be made a considerable distance beyond the diseased area, otherwise relapse in the scar is almost certain to follow. The Finsen light acts best on the dry forms of lupus while the roentgen-ray or radium is recommended for the ulcerated lesions. The exposure to the Finsen light lasts for at least one hour, and only a quarter-dollar sized area can be treated. The sections on radium and the roentgen-rays give the methods of using these therapeutic measures.

Although numerous local preparations have been used the best of these are pyrogallol, 2 to 3 dr. (8. to 12.); lead plaster, 3 dr. (12.); petrolatum, 2 to 3 dr. (8. to 12.).

This is spread on a piece of muslin or lint and applied to an area not larger than 3 inches in diameter and fastened with adhesive strips. After four days a fresh application is made, and the procedure is repeated until the pain becomes severe or the desired result is obtained.

Arsenic is applied in the following ointment: Arsenic trioxide, 20 gr. (1.3); cinnabar, 1 dr. (4.); cold cream, 1 oz. (30.) (Hebra); and to diminish the pain, cocaine hydrochlorate, 5 to 10 gr. (0.32 to 0.65) may be added. This preparation is spread thickly upon lint, covered with wax paper, and bound on the surface. It is changed twice daily and continued for two to four days. It causes considerable inflammatory swelling and edema. It should be applied to an area not larger than 2 inches in diameter. If applied to a smaller area, equal parts of arsenic trioxide and powdered acacia may be made into a paste at the time of application by means of a small quantity of water and applied continuously for from twelve to thirty-six hours. Boric acid ointment may be used to soothe the area of the application.

Tuberculosis Verrucosa Cutis.—**Synonyms.**—Verruca necrogenica; Anatomical tubercle; Lupus verrucosus.

Definition.—Warty growths of varying size on the skin caused by the tubercle bacillus.

Symptoms.—Two types of the affection are recognized: The first is characterized by a single, small red swelling, with a pustular

head which develops at the point of inoculation. The lesion slowly enlarges and forms a warty nodule, with an infiltrated base and a surrounding reddish areola. The pus removed from the small abscesses contains tubercle bacilli. There is usually enlargement of the contiguous lymphatic glands. This is the typical *anatomical tubercle* or *verruca necrogenica*. It usually occurs on the dorsum of the hand or fingers.

FIG. 111.—Verrucous tuberculosis. Started in nose and spread to skin surface. Duration, one year. Patient, aged twenty-nine years.

The second is characterized by the development of an ovoid or lobulated warty swelling which cicatrizes in the center and slowly spreads peripherally. The matured lesion has a depressed, often pigmented cicatrix, surrounded by reddish-brown, warty nodules, which at times are covered with a grayish crust, and frequently an areola of a purplish-red color. The disease may last over a period of months or years, and exceptionally spontaneously involutes. Itching may be present. There is apt to be lymphatic involvement and occasionally the viscera are attacked. The back

of the hands, sometimes both, and the dorsum of the fingers are the usual sites of attack.

FIG. 112.—Verrucous tuberculosis of the leg. (Ormsby.)

FIG. 113.—Tuberculosis verrucosa cutis.

Etiology and Pathology. The cause of the disease is the inoculation of the human or bovine types of the tubercle bacillus at the site of a small break in the skin. It may occur in patients who rub the sputum-covered lips with the back of the hand. It develops

in medical students, physicians, laboratory workers, butchers, and handlers of dead tuberculous bodies.

Histologically it differs from nodular lupus in that the seat of the disease is in the papillary layer of the corium. There is a papillary hypertrophy, a hyperplasia of the epidermis, and the tubercle bacilli are more abundantly present in the tissues than in lupus. Otherwise it has essentially the same anatomical structures.

Diagnosis.—The differential diagnosis given under lupus may be used to distinguish this affection from epithelioma and tubercular syphiloderma. The syphilitic initial lesion can be eliminated by the presence of the Spirochæta pallida, its location, and later the general glandular enlargement and secondary eruption.

Prognosis.—Cure is usually readily effected.

Treatment.—The lesion may be excised or a few roentgen-ray or radium exposures causes its disappearance. It can be removed also by pyrogallol ointment or arsenic plaster, as suggested under lupus. The stick of caustic potash may be applied for a few seconds and the area immediately neutralized with acetic acid. Excision, the roentgen-rays or radium, however, are to be preferred.

Tuberculosis Cutis Orificialis.—**Synonym.**—Acute tuberculous ulcer.

The affection exhibits small, dull red swellings which soon break down and form shallow ulcers with thin undermined edges. The ulcers are small, not exceeding a half inch in diameter, circular in contour, with yellowish granules on the surface and at the margins. They are painless, excepting on motion and friction. They tend to remain superficial and do not heal spontaneously. There is early involvement of the lymphatic glands. Ulcers usually develop on the lips or corners of the mouth; exceptionally, on the genitalia.

Etiology and Pathology.—They are caused by the tubercle bacillus and are rarely seen excepting secondary to visceral tuberculosis.

Koch's bacilli are abundantly present, and in section there is the characteristic anatomical arrangement.

Diagnosis.—It is to be differentiated from chancre.

Prognosis and Treatment.—Excision, roentgen-ray, or radium treatment is advised.

Miliary Tuberculosis of the Skin.—This affection is of rare occurrence. The disease is usually observed in children, particularly following an attack of measles or of some other acute specific fever. The lesions develop rapidly, are widely distributed, and consist of pin-head- to hemp-seed-sized papules, papulo-vesicles, and rarely minute pustules. Subsequently they may disappear with the formation of scales, crusts, or develop into small ulcers. Microscopically a typical tuberculous structure is found and numerous tubercle bacilli. The tuberculin tests are positive, and guinea-pig inoculation with the diseased tissue causes tuberculosis.

Death is to be expected, as it is associated with general miliary tuberculosis.

Scrofuloderma.—Scrofuloderma is characterized by abscesses and ulceration, usually associated with breaking down tuberculous glands or with other subcutaneous tuberculous foci.

The disease begins as a painless swelling in the subcutaneous tissue or true skin. The skin covering the lesion becomes of a purplish-red color, the central portion of the tumor caseates, and an ulcer is formed with overhanging, irregular bluish edges. The floor of the ulcer is covered with pale flabby granulations, and there is a blood-stained serous or purulent discharge containing tubercle bacilli. Fistulous tracts radiate from one lesion to another or

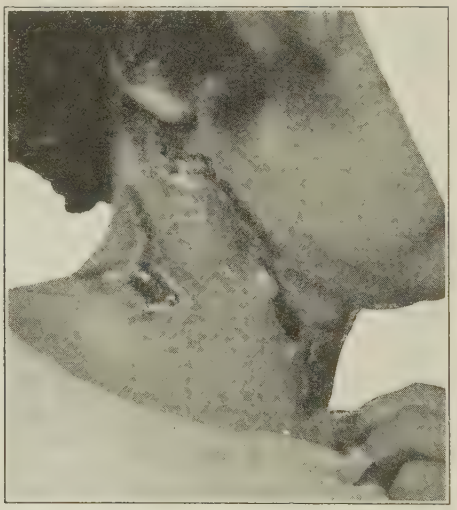


Fig. 114.—Scrofuloderma. Ulceration secondary to tuberculous lymphatic glands.

undermine the sound skin. The destructive tendency may extend to the tendons and bones, particularly when the extremities are involved. There may also be present a chronic form with progressive ulceration extending from the primary focus to the face and neck. There may be considerable suppuration of the skin from secondary staphylococcic infection. After healing occurs an an irregular knotty scar remains adherent to the deeper structures, which retains its pigmentation for a considerable period. The lesions are seen most frequently on the sides of the neck in association with cervical tubercular adenitis. They are next most often seen in the axillæ, the groins, and on the limbs. The face and trunk are occasionally attacked. Conjunctivitis, keratitis,

blepharitis, nasal and aural discharges are sometimes associated conditions.

Underlying the skin lesions there are found one or more tuberculous glands, some of which may be broken down and suppurating. In other instances the glands are swollen, firm, and painless. Tuberculous lymphangitis may be present.

Etiology and Pathology.—Children and young adults are most frequently attacked. The skin is secondarily infected by the breaking down of tuberculous foci in the glands and the subsequent sinus formation. Histologically the common type of tubercles are present and tubercle bacilli are found in the lesions.

Diagnosis.—Scrofuloderma is distinguished from *lupus vulgaris* only by its association with tuberculous glands, the sinus formation and the absence of apple-jelly-like nodules. The two conditions, however, are not infrequently associated.

The *syphilitic gumma* has a more rapid growth, is not associated with tuberculous disease and sinuses, has a characteristic serpiginous and kidney-shaped formation, and the Wassermann test is positive.

Erythema induratum (Bazin's disease) occurs on the lower legs, without the tubercular glands and sinus formation.

Actinomycosis and *blastomycosis* are distinguished by the presence of their respective organisms.

Prognosis.—If the patient's health can be improved and the diseased foci are removed the prognosis is good.

Treatment.—The glands frequently have to be removed surgically and the sinuses opened and thoroughly curetted. Mild antiseptic dressing, such as boric acid ointment, should be applied. The roentgen-ray frequently produces healing and may cause absorption of the diseased glands. Tuberculin treatment as carried out under lupus vulgaris may prove of benefit. Good, nourishing food, healthful surroundings, and tonics such as cod-liver oil and iron are indicated.

Eruptions Probably Caused by the Toxins of the Tubercle Bacillus.

Erythema Induratum.—**Synonyms.**—Bazin's disease; Erythema induratum scrofulosorum.

A disease characterized by the development of indolent and deep-seated gumma-like nodules tending to undergo necrosis with the formation of sluggish ulcers, usually on the lower legs and in cachectic and strumous individuals.

Symptoms.—The characteristic lesions consist of multiple red or purplish, indurated, ill-defined plaques, usually with a diameter

of from ½ to 1 inch. The swellings develop subcutaneously, run a chronic course, and tend to break down into deep ulcers with an irregular edge and with a grayish or reddish infiltrated base. When the ulcers heal pigmented depressed scars, which eventually turn white, result. The lower portion of the calf of the leg, particularly the outer and posterior aspects, is the area usually attacked. The outbreak is frequently symmetrical. Occasionally the upper extremities are involved.

FIG. 115.—Erythema induratum. (Fordyce and MacKee.)

Etiology and Pathology.—Erythema induratum usually develops in young girls earlier than twenty-five years of age. The patients are frequently employed in occupations requiring almost constant standing. Their nutrition is frequently poor because of insufficient food and overwork. There are frequently other evidences of tuberculosis present. Galloway considers the disease should be grouped

into two classes, the one definitely tuberculous and the other closely allied to erythema nodosum.

The affection apparently starts in the hypoderm, and giant and epithelioid cells have been demonstrated in the tissues. Softening of the tumor and destruction of the skin are caused by granular necrosis of the cellular infiltration. Positive results have been obtained by inoculation of guinea-pigs with the diseased tissue, although the tubercle bacillus has not been demonstrated in the tumors or the fluid recovered from the skin. The tuberculin tests are frequently positive.

Diagnosis.—The age and sex of the patient, the location of the lesions and frequently their symmetry distinguish the condition from the serpiginous asymmetrical patches of tertiary syphilis. The absence of broken-down tuberculous glands or other caseating foci distinguish scrofuloderma. Varicose ulcers are associated with dilated veins and occur usually in older individuals.

Treatment.—Rest in bed is important. If the lesions have not ulcerated an elastic web bandage should be used as a support while on the feet. When the lesions have ulcerated rest in bed is still more imperative. Locally, mild antiseptic stimulants such as ammoniated mercury, 20 gr. (1.25); zinc oxide ointment, 1 oz. (30.), may be used. In cases of sluggish healing stimulation with the roentgen-ray or painting with the nitrate of silver stick are of use. Good, nourishing food, hygienic surroundings and cod-liver oil and iron are indicated. If the tuberculin test is positive, tuberculin treatment as suggested under lupus vulgaris may be used.

Lichen Scrofulosorum.—**Synonym.**—Lichen scrofulosus. Hebra was the first to describe the present condition which is characterized by an outbreak of millet-seed- to pin-head-sized firm, flat, rounded, yellowish-brown and reddish papules. Occasionally a minute scale or rarely a tiny pustule is observed on the summit of the lesion. The lesions in the beginning are isolated but later extend to form oval or crescentic patches. There are no symptoms. The papules may persist for months or years, eventually disappearing, usually without, but occasionally with, scarring. The condition may recur. The trunk is usually attacked.

Etiology.—The affection is usually observed in children or adolescents afflicted with tuberculosis of the glands, the bones, the joints, or the skin, but rarely in those showing signs of phthisis. An analogous outbreak has occasionally been produced by injections of Koch's old tuberculin.

Pathology.—The minute papules consist of miliary tubercles which are made up of epithelioid and giant cells. Tuberculin tests give a positive response in a majority of the cases. In a very few cases the finding of the tubercle bacillus in the lesions has been reported.

Diagnosis.—*Lichen planus* occurs chiefly on the flexor surface of the forearms and lower legs, and consists of irregularly shaped flat, shiny, violet-colored papules, which itch. *Papular eczema* always itches severely. *Papular syphiloderm* has a generalized distribution and the various concomitant signs of that disease. *Acne vulgaris* attacks the face in more instances than the back, and there are blackheads, papules, pustules, and at times sebaceous cysts. It develops after puberty. *Pityriasis rubra pilaris* attacks the dorsum of the fingers, the face and elsewhere. *Lichen scrofulosorum* can be distinguished from these by its limitation to the trunk, absence of itching, its association with tuberculous conditions, positive tuberculin tests, its chronic course, and the age of the patient.

Prognosis.—The skin eruption can be readily removed but the patient is probably tuberculous.

Treatment.—Good food, fresh air and tonics like cod-liver oil and arsenic are indicated; and locally, inunctions of cod-liver oil (Hebra) or the preparation used by Crocker, plumbi subacetatis, 15 gr. (1.); thymol, 5 gr. (0.3); vaseline, 1 oz. (30.), may be employed.

Acne Scrofulosorum.—This affection is rare and occurs chiefly in young children. The usual sites of attack are the buttocks and back of the thighs, but any portion of the extensor aspects of the lower extremities may be attacked; less frequently the flexor surface of the arms and forearms and the sides of the face. The lesions are mostly pin-head to the size of a hemp-seed, sometimes as large as a pea, and consists of small pustules on an inflammatory livid-red base. The lesions are moderately firm, seated at the hair-follicle, and do not itch. The outbreak occurs in crops, a few lesions at a time, the older ones becoming absorbed with resulting purplish stains, usually without scarring. Occasionally they extend deep into the tissues and scars result. The structure of the lesions is not typically tuberculous. Tubercle bacilli have not been found, and inoculation experiments have proved negative.

The disease is found in almost all instances in individuals with tuberculous glands, ulceration of the cornea, or other manifestations of tuberculosis, and in addition there is apt to be a family history of phthisis.

Tuberculids.

Folliclis.—**Synonyms.**—Papulo-necrotic tuberculid; Small pustular scrofuloderm (Duhring).

Symptoms.—The affection is characterized by the presence of deep-seated papules of a rounded contour, pin-head to split-pea in size, and varying in color from a dusky red or purplish to a yellowish-white and translucent in appearance. A small pustule

develops in the center of the lesion, which dries up with the formation of a depressed necrotic center. The lesion eventually disappears and leaves a depressed scar, first red, then pigmented, and finally white. The lesions usually remain discrete, although they may be closely crowded together. The eruption is not painful but the lesions are somewhat tender and may itch. Crops of papules may appear for several months or years. The outbreak is usually most severe during the winter months, tending to return during the cold weather. The individual lesion runs a course of but a few weeks. There may be only a few or a large number of lesions present, symmetrically distributed.

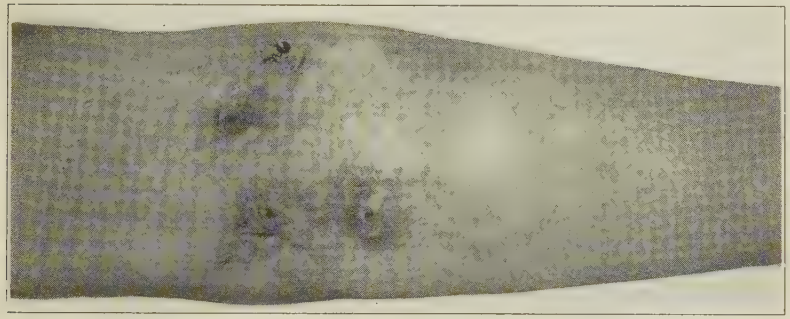


FIG. 116.—Folliclis. Papulo-necrotic tuberculide.

The sites of predilection are the dorsal surface of the fingers, the back of the hands, the wrists, the elbows, the knees, the dorsum of the feet and toes, the ears at times, the buttocks, and occasionally the eyelids. There may be a large number of pit-like scars present, marking the sites of former lesions. The ears and extremities are very liable to chilblains. It is most frequently found in children and often in Russian Jews.

There has been a great diversity in pathological findings as to whether the sweat-coil lesions are primary or secondary. Giant cells and epithelioid cells suggesting a tuberculous process have been found, but no tubercle bacilli.

Tuberculin tests frequently give a positive result.

Acnitis (*Acne Agminata of Crocker*).—The term acnitis was applied to this extremely rare affection by Bartélemy.

Symptoms.—The disease starts as small, shot-like lesions deep down in the skin, which enlarge and cause reddening of the overlying skin, and finally project somewhat above the surface. The lesions vary from a pin-head to hemp-seed in size, occasionally somewhat larger, and are mostly of a dull, brownish-red color, but some

have a yellow central point with or without a comedo. A large proportion contain pus, but some are solid. The majority of the outbreak is observed on the face, but the limbs are occasionally attacked. The most striking feature in a well-marked case is the tendency of the lesions to group about the chin, the cheeks below the orbit, the brows, the temples, the upper lip, and the lower eyelids. In addition there are scattered lesions on the sides of the face, on other parts, and a few on the nose.

FIG. 117.—Generalized tuberculid; small papular and verrucous lesions. (Ormsby.)

The lesions remain for a considerable period, new papules appearing from time to time, and then undergo involution, leaving a small pigmented scar which turns white. Involution may occur rapidly in all of the lesions after the process once starts. The patient may complain of itching. There does not seem to be the same tendency to relapse as in the other tuberculids.

There may be a tuberculous family history or signs of tuberculosis in the patient.

Pathology.—Epithelioid and giant cells have been found in some of the cases, but no tubercle bacilli. Inoculation tests have proved negative.

Diagnosis.—As acne varioliformis, folliclis, and acnitis resemble each other somewhat closely, their points of differentiation should be cited:

Acne Varioliformis.	Folliclis.	Acnitis.
Chiefly on forehead at hairy margin and scalp and less often on neck, and other portions of face.	Chiefly the extremities, the face free, excepting the ears, and exceptionally the eyelids.	Face attacked, exceptionally the limbs.
Lesions hard in beginning and suppurate, dry up with resulting pit-like scars; lesions may be massed without distinct grouping; itching may be annoying feature.	May be grouped on the extremities but not on the face.	Grouped on the face; if on the extremities, lesions are scattered.
Frequently only a few lesions; runs a chronic intermittent course; usually an associated oily seborrhea.	Predominate on the elbows and knees.	Lesions are deeper seated, larger, and leave a larger scar than folliclis.
Changes in the skin are chiefly inflammatory, with a large number of staphylococci.	History of family or personal tuberculosis.	Suppurate more freely and can be enucleated at an early period.
Tuberculin tests are negative.	Giant cells and epithelioid cells present, tuberculin tests positive.	Process much more inflammatory than in folliclis.
	Tends to recur and keep up more or less indefinitely.	Tends to rapidly involute after a course of some months without recurrence.
		Histological picture more or less inflammatory; occasionally giant and epithelioid cells.

Treatment.—As the diseases grouped under the tuberculids are probably caused by the toxins of the tubercle bacilli, the patient should naturally be given plenty of good, nourishing food, the hygienic surrounding should be carefully regulated, and tonic treatment is frequently indicated.

The preparation which I have found most efficient are cod-liver oil, the syrup of the iodide of iron, and some form of arsenic.

Arsenic has been given in the form of Fowler's solution for an adult, 5 minims (0.3), three or four times daily; or as Donovan's solution, 5 minims (0.3), at a dose, after each meal and often also at bedtime.

Although various local applications have been recommended, there is none better than the ammoniated mercury, 15 to 30 gr. (1. to 2.), made up in 1 oz. (30.) of petrolatum; or if on a non-hairy surface in powdered zinc oxide, 2 dr. (8.); petrolatum, 6 dr. (24.), gently rubbed into the lesion, and applied three or four times daily, keeping the lesions constantly covered. This mercurial preparation should not be applied over too large a surface.

Benign Sarcoid Tumors.—Sarcoid tumors are of a lumpy growth, benign, and may be divided into two distinct groups: The *hypodermic sarcoids* of Darier and Roussy, and the *multiple benign sarcoid* of Böck. The Spiegler-Fendt type of sarcoid belongs under the malignant neoplasms.

Hypodermic Sarcoids.—The lesions consist of chronic indolent neoplasms in the hypoderm, which do not tend to ulcerate, and bear a resemblance to erythema induratum (Bazin). They are pea to nut in size, and tend to form nodular patches. They most often occur on the upper portion of the trunk. Women between thirty and forty years are usually attacked. The growths are surrounded by a fibrous capsule and giant cells and lymphocytes have been found. Tubercle bacilli have not been demonstrated and inoculation experiments have been without results.

Multiple Benign Sarcoid.—Böck has described three types of lesions: The large nodular, varying from pea to pigeon egg in size; the small nodular-papular, consisting of millet-seed- to pea-sized growths which may be grouped; and the diffuse infiltrated form. The lesions are in the beginning pinkish and later of a purplish and brownish color and soft in consistency. No apple-jelly-like nodules are found. The sites of attack are the face, frequently symmetrically involved, the neck, shoulders, elbows, and knees. The affection may run a course of some years, eventually stains, and atrophic scars remain. There is no ulceration.

The majority of cases have occurred in females between the ages of fifteen and forty years. There may be enlargement of the lymphatic glands, and there is often visceral tuberculosis. Histologically the lesions consist of masses of epithelioid cells, leukocytes, and a few giant cells.

Treatment.—The treatment consists of preserving the health of the individual. Injections of tuberculin and calomel have proved of benefit. Böck has had excellent results from the administration of arsenic.

LEPROSY.

Synonyms.—Lepra; Elephantiasis Græcorum.

Definition.—An endemic disease caused by a specific bacillus which runs a chronic course and is characterized by anesthetic patches, nodules and ulcerations, and changes in the nerves and bones.

Very few cases have been observed in native-born Americans, but in those immigrants coming from China, Norway, Sweden, the Central and Southern American States, Mexico, Cuba, New Zealand, the West Indies, the Sandwich Islands, etc., where the disease is more or less endemic.

Symptoms.—The incubation period of the disease varies from a few weeks or months to many years. The disease may develop in such a mild form in certain instances and run such a slowly progressive course that it may be in existence for months or years before it is recognized. The onset of the disease may be characterized by indefinite ill health lasting over a considerable period which may be ascribed to malaria, tuberculosis, or some other malady. Chilliness or sweats, intermittent fever, malaise, disinclination to

Fig. 118.—Nodular leprosy. (Courtesy of Dr. Howard Fox.)

exertion, mental depression or hebetude, debility, painful sensations, vertigo, headache and epistaxis, alterations in sensibility and motor weakness may be present. Itching, formication, tingling, burning, picking, pain, localized soreness or tenderness, numb feeling, heaviness, stiffness with neuralgic pains may all be observed by the patient. The mucous membranes of the pharynx and upper passages seem to be attacked before the skin. Invasion of these mucous membranes is shown by a roughened or husky voice, rhinitis with a profuse nasal secretion and increased flow of saliva. The

active and diagnostic manifestations of leprosy are usually divided into two varieties, the tubercular or nodular, and the anesthetic or a mixture of both of these.

Tubercular or Nodular Type.—Before the development of distinct tubercles, variously sized patches with or without infiltration, of a red, violaceous, brownish or blackish color develop. There may also be areas present of increased pigmentation or without any pigment, vitiligo-like. Some of these areas become atrophied, others thickened and firm. The patches vary in size from a pin-head to palm and larger in size, and are either hyperesthetic or more or less anesthetic. The affection may persist somewhat indefinitely as a macular lesion, but eventually infiltrations and nodules develop.

The *tubercular* is more common than the *anesthetic* variety of leprosy, runs a more rapid course, and the skin is chiefly attacked. The typical lesions of *tubercular leprosy* consist of distinct nodules and more or less ill-defined areas of infiltration, with subsequent ulceration. The skin of the face, the ears, and often other parts is thickened, with an accentuation of the natural lines and furrows. The earliest infiltration is usually observed in the eyebrows. The nodular or infiltrated masses, when well developed, cause great deformity of the parts attacked, particularly the face, which has a leonine appearance. The areas of greatest involvement in most cases are the face, the ears, the hands; the palms and scalp are rarely attacked. The tubercles are brownish or brownish-yellow in color, frequently quite large, and develop from the preceding macular patches or from the sound skin. The nodules may persist indefinitely without change or they may disappear, leaving at their sites atrophied, thinned, pigmented skin or cicatrices; partial absorption with the formation of indurated raised fibrous masses may occur, while others tend to ulcerate. New nodules appear from time to time. Fresh crops are frequently accompanied by fever and chilliness. The nodules on the extremities ulcerate, with the formation of shallow, indolent ulcers covered with brownish crusts and a yellowish-brown discharge. Some of these ulcerations extend deep into the tissues, exposing ligaments and bones, while others are superficial and tend to heal. The lymphatic glands and channels leading to them, of the neck, groin and axillæ, become enlarged, particularly in the vicinity of the ulcerating areas, and not uncommonly break down and ulcerate.

The mucous membranes of the nares, mouth, pharynx, and neighboring channels, and also the conjunctivæ, have been attacked. The hair of the eyebrows, and at times the scalp, becomes dry, lusterless, and because of impaired nutrition eventually falls. The nails suffer nutritionally and become thickened, brittle, and somewhat opaque. Early in the disease there is often increased

activity of the sweat and sebaceous glands but later there is lessening of secretion.

Anesthetic Leprosy.—This variety attacks chiefly the nervous system and is characterized by anesthesia and macular patches.

FIG. 119.—Anesthetic leprosy. (Courtesy of Dr. E. B. Vedder.)

There may be the same prodromal symptoms as in the tubercular type but they are frequently mild or unobserved. There are frequently observed lancinating pains along the nerves, particularly

of the extremities, and in certain cases, crops of vesicles or blebs develop along the course of the nerves. These indefinite manifestations, with the addition of somewhat persistent attacks of pruritus, have continued in certain instances for one or more years before the diagnostic features of the disease appear. Eventually a few or many, usually non-elevated, well-defined, pale-yellowish patches, 1 to 2 inches in diameter, develop, most often upon the back, the shoulders, the dorsal surface of the arms, the thighs, about the elbows, the knees, and the ankles. There are in most instances but a few areas present, new patches appearing singly, at times symmetrical distributed. In the beginning these patches burn and itch slightly. Later they become hyperesthetic and eventually anesthetic. They spread peripherally with central clearing, at times, coalesce with the formation of gyrated patches with a well-defined, raised or non-elevated border, and a white, atrophic, depigmented center. The skin generally, both covering and between the patches, becomes atrophic and brownish or yellowish in color.

In this variety also the hair, the nails, the muscles and the subcutaneous tissue may undergo atrophy or degeneration. The affected parts become crooked, thinned, emaciated, and otherwise distorted. Trophic ulcers are apt to develop either spontaneously or as the result of injuries. The muscles atrophy, the fingers become permanently flexed, and the hand claw-like. The bones eventually become diseased, the phalanges drop off or disappear by disintegration or absorption (*lepra mutilans*). The toes and feet share in the same process. There may be a persistent perforating ulcer on the plantar surface of the foot. The hands and feet, in addition to the fingers and toes, in certain cases are gradually lost.

The ulnar nerve is uniformly or irregularly thickened, tender, and gives a cord-like impression on palpation. The perineal and other nerves are likewise enlarged. Distortion of the face is occasionally observed owing to nerve lesions.

There is loss of sensation of the mucous membranes of the mouth, the soft palate, the uvula, and the back of the pharynx. Deglutition is at times difficult and the food is regurgitated through the nose. The *tubercular* and *anesthetic* varieties of leprosy are not infrequently found in the same individual.

Etiology.—The cause of leprosy is infection with a specific bacillus, the bacillus lepræ, which was discovered by Hansen in 1874. The exact method of inoculation is unknown, whether through the mucous membranes of the nose and mouth or some break in the integumentary covering. The causes contributing to infection with these organisms which have been mentioned are hereditary tissue weakness, climate, food, mode of living, and habits.

Pathology.—The *bacillus leprœ* is a delicate rod-shaped, straight, or slightly curved organism, from one-half to three-quarters of the diameter of a red-blood corpuscle in length, and with a width of about one-fifth of its length, and often pointed at one end. They resemble the tubercle bacillus very closely, but are usually found in clumps and in great abundance in affected tissue, staining and decolorizing readily.

Until recently the bacilli have not been successfully cultured. The disease or an analogous condition has been inoculated into Japanese dancing mice, white mice, rats, and monkeys, in most instances, by means of cultured organisms.

These organs have been found in leprosy cases in nearly all the tissues of the human body with the exception of the muscles, spinal cord, bones, joints, and some of the secondary skin lesions. They are rarely found in the epidermis or in the blood. The organisms are rarely found in the normal physiological secretions. They are never found in the urine or the menstrual blood.

The bacilli are most numerous in nodules which have just completed their full growth, although they are also found in the infiltrated patches. The organisms are almost invariably situated within a "lepra cell," occasionally in endothelial cells and white-blood corpuscles.

Histologically the chief changes are found in the cutis and consist of round epithelioid and spindle cells, and also giant cells. The nodule consists of granulation tissue similar to that seen in lupus and syphilis: it is less vascular, and therefore forms and retrogresses less rapidly, and the cells are larger than in the two diseases named.

Diagnosis.—If the course, character of lesions, the anesthesia, the various deformities and derangements are considered, a well-developed case should offer very little difficulty in diagnosis. In the early stage the diagnosis is one of great difficulty. The demonstration of the bacillus lepræ settles the diagnosis.

Prognosis.—The prognosis is unfavorable, for apparently in almost all cases it is only a question of months or years before death results.

Treatment.—*Prophylaxis* consists of segregation. Opinion is considerably divided as to the necessity for this, and in a neighboring large city sufferers from the disease are allowed to follow their daily avocation without restraint. The anesthetic cases are much less contagious than the tubercular form.

The patient's general condition should be raised to the highest possible point by nourishing food, clean surroundings, and tonics. The preparations which have proved most popular are: Chaulmoogra oil, from 5 minims (0.3) to 1½ dr. (6.), or more three times daily; gurjuu oil emulsion (3 to 5 parts of lime-water to 1 of the

oil), 2 to 4 dr. (8. to 16.) two or three times daily. The mixed ethyl esters, derived from chaulmoogra oil, containing 2 per cent of iodine, are now giving excellent results.[1] Strychnine sulphate or nux vomica are frequently prescribed in full doses, in addition to either of the preparations mentioned. Locally the skin should be kept clean and boric acid ointment or lotion applied. The roentgen-ray has apparently caused some benefit. Numerous preparations both for internal and external use have been exploited, but they have produced no prolonged benefit. It is to be hoped that eventually a successful serum will be produced.

RHINOSCLEROMA.

Synonym.—Gleoscleroma.

Definition.—An affection characterized by a hard nodular new growth, involving the nares and region of the nose, which runs a chronic course. The disease was first described by Hebra and Kaposi in 1870.

Symptoms.—The disease begins with involvement of the mucous membrane of the nose, particularly of the alæ and sputum, and eventually, frequently after a considerable period, extends to the cartilages and skin of the nose and surrounding parts. The affection may originate in the posterior portion of the soft palate, the larynx, or the trachea. The enlargement of the growth causes a change in the shape of the nose, the latter becoming broader, flatter, and rigid and hard to the touch, resembling ivory.

The walls of the nasal passages become hypertrophied, the lumen reduced in size, or total occlusion may occur. The tumors of the skin are flat, slightly elevated, sharply marginated, isolated, hard and painful on palpation. They are deeply imbedded in the cutis, bound down to the underlying structures, and are covered by whitish or reddish skin which is either smooth or wrinkled, shiny, dry, traversed by bloodvessels, and the hair follicles are absent. Fissures may develop on the affected areas, but ulceration is a rare complication. The nose and nares are attacked in about 90 per cent of the cases (Wolkowitsch).

Etiology and Pathology.—It is observed in both sexes between fifteen and forty years. The cause of the disease is believed to be a specific bacillus, Bacillus rhinoscleromates (Frisch, Paltauf). The bacilli are non-motile and arranged in groups of two or four, usually encapsulated, and closely resemble pneumococci.

Histologically the corium, particularly the papillary portion, is densely infiltrated with small cells, epithelial cells, and large

[1] MacDowell and Dean: Jour. Am. Med. Assn., 1921, **66**, 1470.

dropsical and colloidal round cells. True giant cells have not been found.

Diagnosis.—In *rhinophyma*, a hypertrophic anomaly of acne rosacea, attacking the nose, the growth is soft and vascular rather than board-like in resistance. The hardness without tendency to break down and ulcerate distinguishes rhinoscleroma from syphilis and epithelioma. Its great rarity and its occurrence in the foreign-born almost exclusively are points assisting in the diagnosis.

Prognosis and Treatment.—The disease is progressive and rebellious to treatment.

Recurrence has frequently followed operative treatment. Vaccine treatment has been tried without much success. The roentgen-ray apparently offers the best means for betterment if not cure.

GANGOSA.

Synonym.—Rhinopharyngitis mutilans.

Definition.—An affection characterized by an acute or chronic destructive ulcerative process attacking primarily the soft and hard palate, the pharynx, the larynx, and later the nasal cavity, the nose, and the contiguous tissues.

Symptoms.—The affection apparently starts with a superficial ulcer on the back of the pharynx, the posterior faucial pillar, or on the free edge of the palate. The lesion is covered with a thin, dirty, brownish-gray slough. There may be deep and extensive destruction of both the soft and bony tissues.

It may run a slow or rapid course, usually the former, the active stage lasting for one or more years, which is followed by a partial or complete arrest in the spread of the condition, or the disease may again become active.

Etiology.—Geger has found a bacillus closely resembling the Bacillus diphtheriæ in all of his cases. This organism has not as yet been proved as causal, and there is a considerable diversity of opinion. Although the majority of observers are opposed to its relationship to syphilis, Branch maintains that it is syphilitic. It is probably contagious.

Most of the cases have been observed in the pure-blooded natives of Guam and not in the mixed breeds. Instances have also been found in the Ladrones and Caroline Islands, Fiji, British Guiana, Jamaica, Italy, Dominica, Nevis, Philippine Islands, and Panama.

The histological picture is that of a granuloma, according to Fordyce, resembling somewhat tuberculosis cutis.

Prognosis and Treatment.—The disease usually runs a progressive course, causing great destruction of the tissues, but does not end fatally.

Treatment consists of placing the patient in hygienic surroundings, giving good food and tonics, and locally, antiseptics and deodorants. For the latter purpose potassium permanganate in a 1 per cent solution is the favorite. Early cases should be thoroughly cauterized and tincture of iodine applied. The roentgen-ray and surgical measures should be considered.

ANTHRAX.

Synonyms.—Malignant pustule; Pustula maligna.

Definition.—A disease characterized by the development of a furuncle or carbuncle-like gangrenous lesion, caused by inoculation with the Bacillus anthracis, and accompanied by grave constitutional symptoms.

Inoculation of the disease through other channels than the skin will not be considered.

Symptoms.—One to two days after the inoculation of the skin with the Bacillus anthracis, itching, burning, and a small reddish papule appears. In a few hours to a day a vesicle or bleb forms on the summit of the original lesion, which has grown rapidly to the size of a large, flattened pea. The contents of the vesicle or bleb become hemorrhagic or purulent, rupture occurs, and a depressed center with a surrounding black eschar is observed. The entire center of the patch becomes gangrenous and the circumference is frequently made up of large, firm vesicles. The surrounding skin for a considerable distance beyond the area affected is hard, infiltrated, and edematous. There is usually but one lesion present, and it is commonly observed on the exposed portions of the body, the face, the neck, or the hands; the areas offering the easiest inoculation into a small trauma.

There may be high fever, chills, vomiting, prostration, and pains in the head and bones. In the mild types of infection the constitutional symptoms may be comparatively slight.

Etiology.—Those handling the hides or bodies of animals which have died of splenic fever are prone to an attack. Therefore, the attacks are usually observed in morocco workers, butchers, tanners, and wool-sorters.

The Bacillus anthracis is found in the organs, secretions, and at times in the blood. Sections from the anthrax skin lesion showed a very large number of these organisms, dilated bloodvessels, an interstitial edema of the skin and hypoderm.

Diagnosis.—The occupation of the individual, the single gangrenous patch, with its vesicular border, the surrounding edema and infiltration, and marked constitutional involvement make a typical picture.

Prognosis.—About one-third of those attacked by anthrax die.

Treatment.—The entire diseased area should be excised, going a considerable distance beyond the lesion. Injections of tincture of iodine or a 5 per cent solution of carbolic acid at five or six points around the border, has proved successful. This should be repeated if the disease is not checked. Anthrax vaccine treatment should also be employed. Supportive measures are frequently indicated.

GLANDERS.

Synonyms.—Equina; Farcy; Malleus.

Definition.—A malignant disease caused by a specific organism derived from the horse, mule, or ass, and characterized by grave constitutional symptoms, inflammation of the respiratory tract, glandular enlargement, and a cutaneous outbreak.

Symptoms.—The disease is inoculated through a break in the skin surface or by way of the mucous membrane of the eye, nose, the mouth, or the respiratory tract. The incubation period varies from a few days to several weeks. The onset of the disease is characterized by general symptoms of malaise, fever, rheumatic pains, and in certain cases chills or chilliness.

Very early in the disease a nasal discharge is observed, at first catarrhal, then purulent and afterward stained with blood; it is thick, tenacious, and offensive. The inflammation spreads to the respiratory, oral, and ocular mucous membranes. Minute gray points may also be found in the respiratory passages. These granulations break down into ulcers, which are covered with a yellowish pus-like discharge full of bacilli.

If the skin has been inoculated with the disease at the point of infection, a painful, red, and spreading ulcer forms, with foul, irregular edges, chancroid-like, and covered with a dirty, blood-mixed, offensive discharge. The neighboring lymphatic vessels are swollen and inflamed. There may be phlegmonous inflammation with pustules and ulcers attacking the entire extremity or region in which the disease started.

The characteristic skin lesions, in addition to that described at the point of inoculation, begin deep in the corium, and appear as scattered groups of red spots, which soon become shot-sized papules. The papules may become vesicular, bullous or pustular, on a livid red base. The lesions at times coalesce into irregular, superficially ulcerated areas, with a sloughing surface or dry, black, gangrenous patches may form. Infiltrations also develop in the subcutaneous tissue and break down into large sloughs (so-called farcy buds). General glandular enlargement eventually may develop with abscess formation. The various skin lesions may

finally affect the major portion of the cutaneous surface. In the acute cases the constitutional involvement becomes more marked, the symptoms grave; the intestinal tract may be attacked, symptoms of general sepsis develop and death results.

In the chronic variety there may be but a few cutaneous lesions present, and the constitutional symptoms are comparatively mild. This type of the disease may last for months, death resulting from marasmus or renal complications, or the acute type may supervene and the patient rapidly succumbs.

Etiology and Pathology.—The disease is of rare occurrence in this country, usually developing in those in contact with horses, mules, donkeys and asses. The disease may be transmitted from man to man. The disease is caused by the glanders bacillus (*Bacillus mallei*), resembling but smaller than the tubercle bacillus. The organism is found in all the lesions, the blood, and other tissues. The lesions consist of round-celled granulation tissue, which tends to break down.

Diagnosis.—The characteristics of a fully developed case and the occupation of the patient offer a clear differentiation from other conditions. The bacillus should be sought to prove the diagnosis.

Prognosis and Treatment.—Death results in a few days to a few weeks in the acute cases and in certain instances before the skin lesions appear. About one-half of the chronic cases terminate fatally.

Treatment is entirely symptomatic, and locally surgical and antiseptic. It is to be hoped that eventually a serum will prove efficacious.

DIPHTHERIA OF THE SKIN.

The bacillus of Löffler gains entrance to the skin through some opening; in cracks, slight excoriations, erosions resulting from herpes, and in breaks in the continuity of the skin secondary to an eczema, an intertrigo or an impetigo. The former writers upon this subject considered the affection, in most cases, developed secondarily to other patches of diphtheria in the patient, and they also affirmed that every case had a diagnostic false membrane. The bacillus attacked the skin through some break in its continuity; this area would almost immediately become painful; it would puff up; there would be a profuse fetid discharge; a false membrane would form and the edge of the patch would become elevated and the bottom ulcerated. Not infrequently an attack of erysipelas would develop around the diphtheritic patch. The prognosis was grave because of absorption of the diphtheria toxins from the large surface involved. Paralysis, particularly of the extremities, has followed the clinical form.

It is not rare, however, to observe an attenuated form that consists of grayish plaques, more dry than moist, discrete and slightly spreading. These plaques are detached in about ten days, some persisting for a longer period, but without presenting a grave appearance.

Several cases of diphtheria of the skin have been reported in which there was no false membrane formation, but the lesions were of an impetiginous eczema aspect or of the bullous or vesicular variety. The writer has seen 2 cases of diphtheria of the skin which had the appearance of bullous impetigo, excepting for the virulent appearance of the lesions and a profuse cheese-like purulent contents.

It is proved that diphtheria of the skin may begin as a primary condition, remaining localized as such, or may be followed by involvement of the throat or larynx. The diagnosis has to be proved by means of smears or cultures. The prognosis of the localized disease is not grave; the chief danger is from sequelæ. Verbizer reported 10 cases of the affection, 9 of which did not have the false membrane or the other usual manifestations of diphtheria. All but 2 of his cases occurred in infants; 4 terminated fatally. One of the 2 cases of the writer ended fatally. The cases of Verbizier attacked the face and the head, and were associated with a grave conjunctivitis, sometimes an otorrhea and rhinitis.

Since the serum treatment of diphtheria has been carried out secondary diphtheria of the skin is of rare occurrence. Treatment consists of antitoxin and local cleanliness.

Pseudo-diphtheria of the Skin.—Eruptions of the skin caused by the pseudo-diphtheria bacillus have rarely been reported, probably because sufficiently careful examination has not been made. The outbreak is caused by an inoffensive organism and therefore there are no constitutional symptoms such as are found from the invasion of the malignant bacillus of Löffler (diphtheria bacillus). The usual type of outbreak has the appearance of an impetiginous eczema, and excepting for its persistence and resistance to treatment there is nothing to make one think that it is other than the clinical appearance would suggest. Vesicular and also bullous outbreaks may be caused by this organism. Both careful cultural experiments and animal inoculation are required to differentiate the organism from the diphtheria bacillus. In a case of this character seen in the service of C. N. Davis at the Pennsylvania Hospital the posterior surface of the neck and the adjoining scalp were involved by an eruption which clinically was indistinguishable from an impetiginous eczema. Although numerous local applications were employed, the disease was not eradicated until autogenous vaccine treatment was given.

C. DISEASES CAUSED BY SPIROCHETES.

SYPHILIS.

Synonyms.—Pox; Lues.

Definition.—A constitutional, infectious, contagious disease, caused by a specific organism which is either acquired or inherited, and characterized by an early generalized, multiform eruption, and later by localized lesions with destructive tendencies.

Syphilis, for convenience of study, may be divided into three stages and three incubation periods. The first incubation period is from the time of infection until the appearance and development of the initial lesion, usually three weeks, sometimes more or less. The primary stage is characterized by the fully developed indurated initial lesion and the typical glandular enlargement. In the secondary period of incubation, which lasts, as a rule, about six weeks, various concomitant signs of syphilis are developed, increasing in severity as the secondary or eruptive stage is reached. The secondary stage is characterized by the appearance of the eruption and various other symptoms to be described in detail. The third period of incubation is of indefinite duration, lasting from a few months to a few or many years. The third stage is also eruptive in type but is more destructive than the secondary period, and somewhat localized rather than generalized.[1]

Eruptions of Acquired Syphilis.

Forms.	*Varieties.*	*Descriptive adjectives.*
EARLY.		
Macular	Roseolar.	
	Annular.	
	Vitiligoid.	
Maculo-papular		
Papular	Miliary.	Disseminate, corymbose, annular.
	Lenticular.	Disseminate, corymbose, hypertrophic, confluent, squamous.
	Discoid.	Moist, annular, confluent, squamous.
Papulo-pustular		
Pustular	Acuminate.	Crustaceous.
	Obtuse.	Crustaceous.
	Ecthymoid.	Crustaceous, rupial, ulcerative.
LATE.		
Nodular	Agminate.	Confluent, squamous, cicatricial.
	Circinate.	Squamous, crustaceous, ulcerative.
	Serpiginous.	Crustaceous, ulcerative, cicatricial.
Squamous	Diffuse.	
	Circinate.	
Gummous	Diffuse.	Verrucous, crustaceous, rupial, ulcerative.
	Tuberous.	Ulcerative, cicatricial.

[1] George Henry Fox has suggested a new classification for the eruptions of acquired syphilis, and it has been adopted by the American Dermatological Association (May 14, 1914):

Chancre.—The chancre is soft in consistency in the early stage, practically no induration being noted before the tenth day. Slight induration can usually be palpated about the fourteenth day. The penis or some portion of the female genitalia are the most common areas involved. Chancres of various types may appear as a small erosion (the most common beginning), a silvery spot, a dry papule or patch, an umbilicated papule or nodule, a purple necrotic nodule, a crusted ecthyma-like lesion, and those with various other characteristics. The chancrous erosion begins as a rounded excoriated spot, with its surface on a level with the surrounding parts, dull red, later copper colored, generally circular or

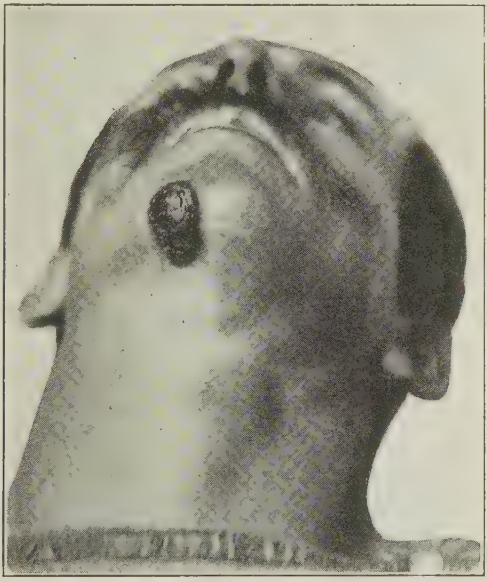


FIG. 120.—Chancre.

ovoid in shape. The floor is usually slightly excavated, but at times may be elevated. It has a smooth, polished surface, at times granular, with a serous oozing. Parchment-like chancres, in which the induration is spread out in a disk-like mass, are usually found on the skin of the penis. Densely indurated chancre, the true Hunterian sore, is not so usual as the erosive type, the chief location being the sulcus coronarius. An extragenital chancre usually appears as a small red papule with more or less scaliness, and tends to become crusted. The fungating, warty, papillomatous, cauliflower-like chancre, of a deep red color, is most frequent upon the finger or hand. The initial lesion of the lip usually occurs upon

the vermilion, frequently extending to the skin surface. Chancre of the tongue occurs, as a rule, upon the tip or lateral portion. Chancre of the breast is usually of the erosive or encrusted types,

FIG. 121.—Chancre.

FIG. 122.—Chancre.

although at times the initial lesion may be an indurated fissure; the nipple, or areola, are most frequently attacked. In almost every case of hard chancre the neighboring lymphatic ganglia

are indolently enlarged, and at times the lymphatic vessels are enlarged in a similar manner. Exceptionally the glands may be palpable on the fifth day after the appearance of the sore, and, as a rule, between the seventh and the tenth, but in certain cases much later. The enlargement at first is more pronounced on the side of the initial lesion. The glands are painless, densely indurated, freely movable, separate from each other, and feel like almonds or little round tumors. The most marked enlargement is usually noted in the ganglia near the initial lesion, although general glandular enlargement of the superficial lymphatic glands frequently occurs before the eruption appears.

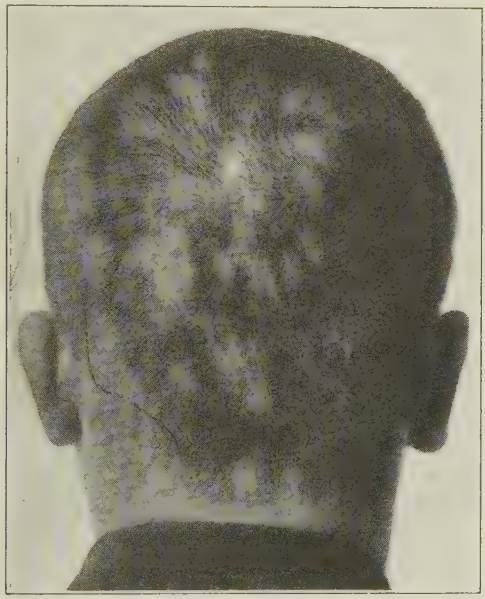


FIG. 123.—Syphilitic alopecia.

Secondary Incubation Period.—During the stage of secondary incubation various signs of the constitutional involvement of the patient by the disease develop, such as anemia, wandering pains over the tibia, the sternum, and the articulations, a cachectic appearance, severe persistent headache, some loss of weight, a dingy or unhealthy tint to the skin, and general lassitude. The eruption may be ushered in by moderate or high fever, at times being mistaken for typhoid. Frequently, however, none of these signs of constitutional involvement are present. These various symptoms are found, as a rule, in those who are physically unfit

to resist the disease. The above symptoms, if present, usually appear a few days to a week or more before the eruption.

Secondary Stage.—The secondary eruptions of syphilis have certain characteristics in common. The eruption is more or less generalized and somewhat symmetrical, although certain types show predilection for various areas. It may be stated, in a general way, that the favorite areas are the upper part of the forehead, just at the margin of the hair, the angles of the mouth, the naso-labial folds, the palms, the soles, the region of the anus, and the genitalia. The eruption may be abundant or somewhat scant, and varies considerably in duration. In relapses the eruption is much more scanty, and usually generally distributed and with more tendency to grouping.

Configuration and Color.—It should be well noted that in the beginning or recent eruption the color is frequently pink or even reddish, which, however, after some days or weeks tends, to become dark red, and then the time-honored "ham color." In certain cases the general color of the eruption remains of a pink or red tint throughout. The lesions are usually oval or round, but at times are somewhat irregular in conformation. Infrequently in the white, but frequently in the negro, the lesions, particularly on the face, are annular. The later the lesions the more tendency there is to grouping; the deeper the lesions are the less general is the distribution. In tertiary lesions there is a characteristic diagnostic tendency to segmental, circinate, and serpiginous arrangement. The ulcers of the early pustular syphiloderms are superficial and generally have no special characteristics; those of the later forms are segmented, rounded, or kidney-shaped. The scars resulting from syphilitic lesions are usually soft, pliable, insignificant, and commonly show minute punctæ or perforations, the sites of former follicles. The scars of the late lesions take the diagnostic shape of the former eruption; the same pliable scars remain as in the earlier type. Usually in syphilis more than one type of eruption is present, thus at times assisting greatly in the diagnosis. The syphilitic eruption is generally unaccompanied by subjective symptoms; the negro, however, complains at times of great pruritus.

Course and Duration.—The syphilodermata of the active or secondary stage usually appear somewhat rapidly and attain full development in one or two week, after which it is not uncommon for a few new lesions to show themselves irregularly for a short time. In some cases there may be a scanty, scattered outbreak at first, followed in one or two weeks by numerous new lesions, or the eruption may remain scanty. After a few weeks the macular syphilide has pretty generally disappeared. In the other types, however,

there is often a stationary period for a month or so, disappearance gradually taking place in a few months, occasionally leaving persistent lesions as those on the palms or the soles The papular eruption tends to relapse for some months. In the tertiary stage there is very little tendency to spontaneous disappearance.

Fig. 124.—Syphilis (papulo-squamous type).

Concomitant Symptoms.—Various signs or symptoms of the disease are associated with the active or secondary stage, being known as the concomitant signs of syphilis. The chancre often persists or the mark or scar is found; generally adenopathies are present, pharyngitis, mucous patches, or superficial ulcers on the inner surface of the lips, in the mouth, pharynx, etc. Iritis, cephalgia, bone pains, sallow or dingy-looking skin, cachexia, and loss of flesh may be present. Frequently but a few of these symptoms are

present in a case. Concomitant symptoms are frequently wanting in the tertiary stage, although bone lesions and pain, alopecia, superficial glossitis, and leukoplakia may be present. Alopecia, thinning of the scalp hair, "moth-eaten appearance," is more usual in the secondary than in the tertiary stage, but is infrequent at the most. In this condition there may be simply thinning of the scalp hair, but at times incomplete bald areas may be seen; the hair frequently becomes dry, lusterless and lifeless in appearance.

FIG. 125.—Syphilis, large flat, papular type.

The nails also may be attacked furrows, depressions, opacities, thickening of the nail itself, with brittleness of its free edge, may be noted. At times the nail bed becomes thickened, the nail is raised, and in some cases shed. Paronychia, inflammation of the skin surrounding the nail, is a not unusual accompaniment of disease of the nail itself.

Macular Eruption. This is usually the earliest and most common of the secondary syphilitic types. It is generally distributed,

PLATE VIII

Pigmentation from Fading Macular Eruption.

Inoculated her two-year-old child with initial lesion of the cheek by kissing.

being most abundant, as a rule, on the sides of the trunk and the axillary folds, the umbilical region, the neck, and the flexure surface of the arms. The palms and soles also may show numerous lesions, with a tendency to become papular. The face and the dorsal surface of the hands and the feet frequently escape, although ill-defined papules may in certain cases be found at the corners of the mouth and the naso-labial folds. The eruption consists of small or large, commonly pea- to bean-sized, rounded or irregularly shaped,

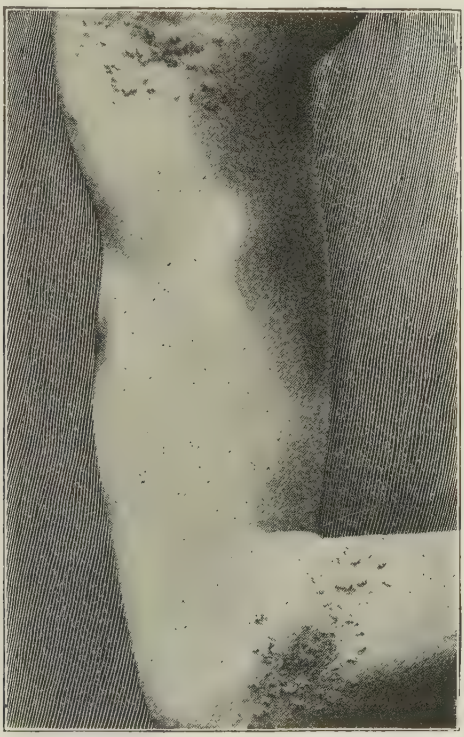


FIG. 126.—Corymbose papular syphilide. (Ormsby.)

sometimes slightly raised erythematous spots, not entirely disappearing under pressure. Slight scaliness may be noted in those macules which tend to become papular. A slight or moderate brownish-yellow pigment may remain for some weeks after the disappearance of the lesions. In most cases of macular lues, some, if not all, of the lesions, particularly on the palms, the soles, and around the anus, become papular in type.

Papular Eruption.—There are several varieties of the papular syphiloderm which may be classed under the headings of the

miliary papular and the *flat papular*. The *miliary papular* is a fairly common variety, but much less so than the flat papular. In distinction from the flat papular it is follicular and connected with the hair follicle. These miliary papules may be small or large. In the smaller variety the lesions are pin-head in size, in the larger two or three times as large. The surface of the lesions may be somewhat pointed or rounded. It is usually most abundant upon the shoulders, the upper part of the trunk, the arms, and the thighs. The face, however, frequently shows a profuse eruption. The lesions are often closely crowded, with a tendency to form groups, particularly in relapses. At times a very slight umbilication may be noted. There might be a slight scale on the surface of some of the lesions. Miliary pustules may be associated with the miliary papules. The *flat papular syphiloderm* varies from pin-head to bean or larger in size. There is usually a predominance of either the large or small type in each case. The lesions are flattened, slightly elevated, round or oval, and show some infiltration. They are generally distributed over the body, usually being well separated from each other. The smaller variety, however, at times tends to group in the neighborhood of the nose. The eruption is not so abundant as in the miliary papular, and other types are usually absent. This eruption may be found on all parts of the body, the scalp, the face, the trunk, and the limbs; the flexure surfaces are particularly involved. There may be an irregularly arranged line of papules on the forehead, at the hairy border, known as the *corona Veneris*. This type (papular) is a very common one, and may be the first eruption recognized. It may take some weeks for the eruption to fully develop.

Moist Papules.—The moist papules are usually met with in the secondary stage. They are generally situated on opposing surfaces where there is a certain amount of natural heat and moisture and some friction. The usual location is around the anus and genitalia, particularly in women; the perineum, the genito-crural region, the corners of the mouth, and the naso-labial folds; the axillæ and the umbilical area are not unusual situations. They may be met with between the fingers and the toes, and beneath the breasts in women. They commonly begin as ordinary papules, which flatten down somewhat and become macerated by moisture and heat. They are grayish or dirty in color, with usually a slight mucoid discharge on the surface. At times these lesions become hypertrophic, distinctly elevated, with an irregular surface; they are then known as *condylomata*. Several of these large lesions may coalesce, forming a large papillomatous "cauliflower-like" lesion known as a vegetating syphiloderm or *frambesiform syphiloderm*.

PLATE IX

Small Miliary Papular Syphiloderma.

Pustular Eruption.—The pustular syphilodermata occur in several distinct types. They are much less frequent than the papular, and are usually noted in those individuals who are poorly nourished. Therefore this type is more frequently seen in the

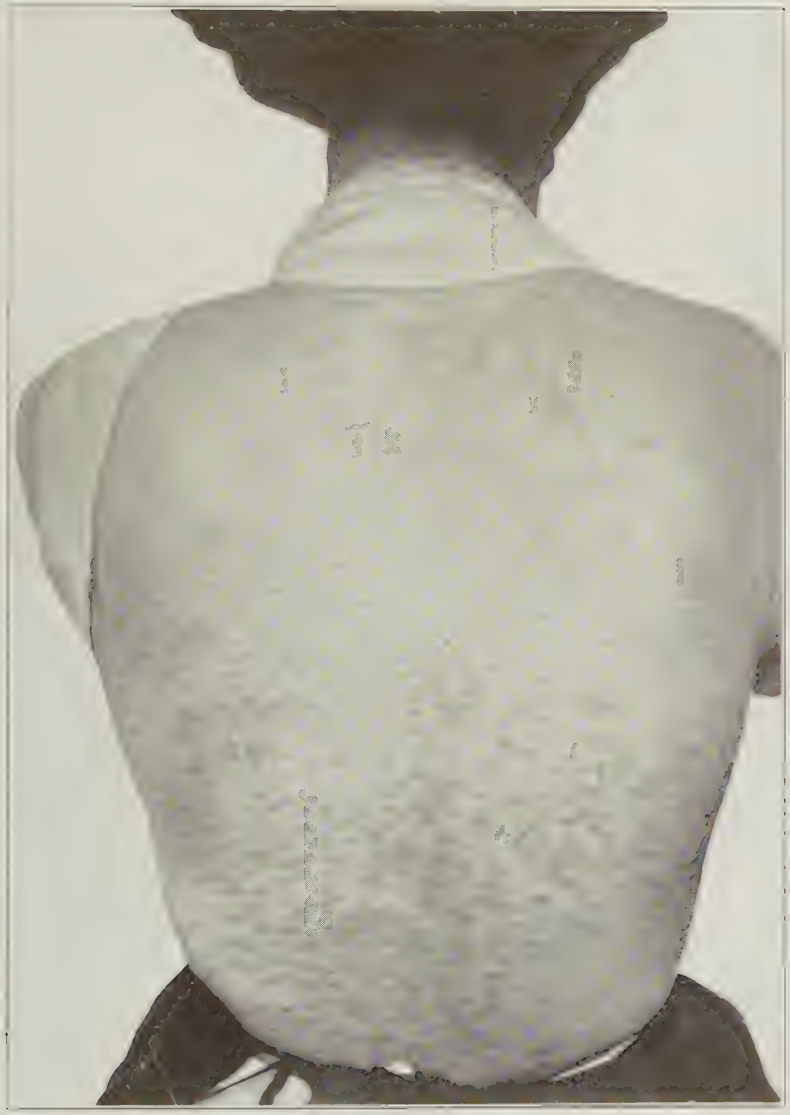
Fig. 127.—Syphilis, papulo-squamous type.

Fig. 128.—Syphilitic condylomata.

FIG. 129.—Large, flat, pustular syphiloderm. (Ormsby.)

FIG. 130.—Syphilis. Large miliary, pustular type.

PLATE X



Syphilis of the Large Miliary Papular Type.

poorer class of patients. It is at times rebellious to treatment, and frequently shows a more severe type than the macular or papular eruption. The pustular eruption may be classed under two general headings: The *acuminate pustular* and the *flat pustular*. These two forms are divided into the *large* and the *small*. The *small acuminate pustular* consists of lesions which are minute, pin-head, or slightly larger in size, rounded or pointed, and generally con-

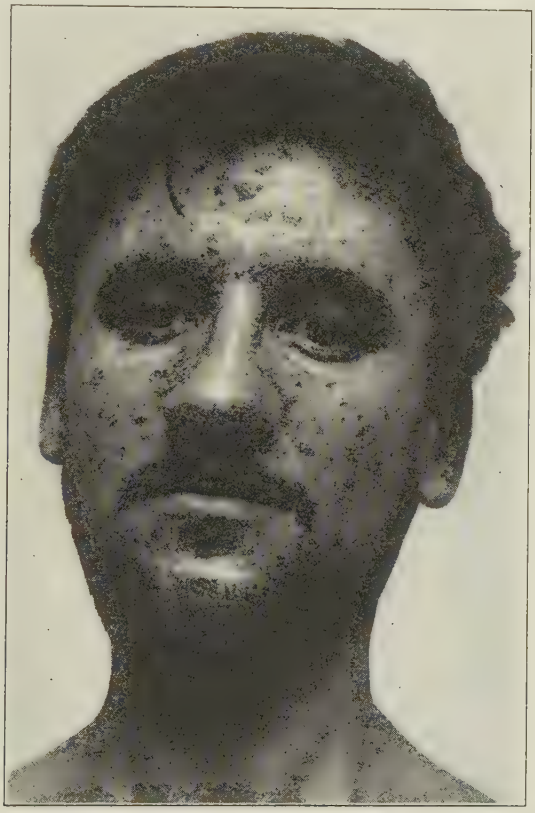


FIG. 131.—Syphilis. Large miliary, pustular type.

nected with the hair follicle. This eruption is somewhat similar to the miliary papular, and many of the lesions in the early stage are papular, later becoming pustular. The eruption frequently is abundant. A slight umbilication may be noted in some of the pustules. In the *large acuminate* form the lesions are small to large pea-sized. Irregular grouping may be present. The eruption is generalized. The *small flat pustular syphilodermata* show lesions

from pea to finger nail in size, which are flat, discrete, and at times irregularly grouped. These lesions may be abundant on the face and the scalp and sparse on the body. Other types of eruption are frequently associated as macules and papules. In the *large flat, pustular type* the lesions are from finger nail to palm in size. They show more depth of lesion and more crusting than in the smaller form. In each, however, there is the same tendency for the pustules

FIG. 132.—Syphilis. Pustulo-crustaceous (rupial) type.

to break, to dry rapidly, and to become crusted. The crusts are brownish-yellow, brownish or greenish in color, thick, uneven, and friable, or at times tough; they may not entirely cover the base of the lesion. At times the exposed part of the base shows ulceration. In certain cases the crusting tendency is so marked, layer after layer being formed, that an oyster-shell-like crust is formed. This type is known as the *pustulo-crustaceous*. There are two marked characteristics in this type—either an excessive crust formation or

deep ulceration of the lesions, the two being more or less associated, forming the *ecthymatous*, *rupial*, or malignant form of syphilis.

Fig. 133.—Rupial and pustulo-crustaceous syphiloderm.

Fig. 134.—Syphilis. Papulo-nodular type.

Scarring and marked pigmentation almost always follows this type, and the patient frequently is in a markedly cachectic condition. The pustular type is not a common form of syphilis.

Palmar and Plantar Syphiloderm. The palms, chiefly, and also the soles of the feet, are frequently involved by dry, syphilitic eruptions, such as the macular, the maculo-papular, the papular, the papulo-nodular, and the nodular. These areas usually share in the more or less generalized eruption of the active or secondary periods and they are not infrequently the sites alone attacked in the relapsing cases, and often show the papulo-squamous form late in the disease. The eruption found in the secondary stage is

FIG. 135.—Nodular syphiloderm.

practically the same as is seen on the general cutaneous surface, but the thickness of the epidermis on the palms and the soles makes the papular lesions appear as macules. The lesions show a tendency to coalesce, thus having in the relapsing or late stage a serpiginous, crescentic, segmental, or irregularly bordered arrangement. The papulo-nodular and nodular types show very little difference, except for their depth, from the late relapsing lesions. There may be a certain tendency to fissuring. There is usually but little scaliness present. The eruption is at times observed on both the palms and the soles. It may be scanty or abundant. It is generally limited to the palms, and frequently but to one. The eruption usually develops slowly, and frequently after obtaining a small size remains

stationary indefinitely. The central portion of the palm and the thenar eminence are the favorite sites of attack.

General Characteristics of Late Lesions.—The late lesions of syphilis are usually classified under the heading of tertiary, and are generally divided under two subdivisions, the *nodular* and the *gummatous*, with various modifications of each. An indefinite incubation period of months or years frequently elapses between the early or secondary period and the late or tertiary. The late lesions are, as a rule, few in number, show a great tendency to grouping, are deep down in the corium or true skin, are destructive

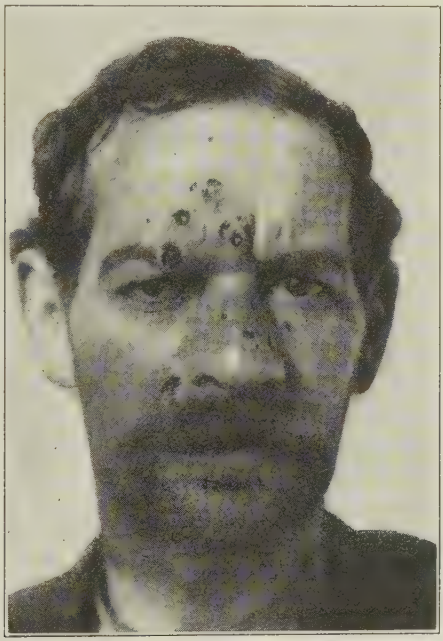


FIG. 136.—Syphilis. Nodular gummatous type.

in tendency, and have no characteristic of spontaneous healing like, at times, is observed in the secondaries. They are progressive in type, and the diagnosis has to be based almost invariably on the general character of the lesion itself. The group or the single lesion is arranged as a segment of a circle with a serpiginous or crescentic border, kidney-shaped. Previous scars, ulceration, or scarring in the lesion under observation is frequently of assistance in diagnosing syphilis. The diagnosis can scarcely be made in certain cases unless the observer has seen lesions of the same character previously. A positive Wassermann test is usually present or a definite history is obtained.

Nodular Lesions.[1]—The nodular form exceptionally occurs within the first year of the disease, but usually much later. It has the same general color as most of the other lesions of syphilis. Papulo-

FIG. 137.—Syphilis of a late papulo-squamous type.

FIG. 138.—Late squamous syphiloderm.

[1] The term *tubercular* has been omitted and *nodular* substituted so that the student will not be confused by any implied relationship to tuberculosis.

PLATE XI

Syphilis, Papulo-nodular Type.

nodular lesions are at times noted on the face, with a papular eruption on the body. It generally appears as a very late secondary or years afterward as a tertiary outbreak The lesions are usually grouped, with a firm consistency, circumscribed, moderately elevated, a smooth surface, slightly scaly, round or acuminate in shape, and arranged as described above. In the majority of the cases, after some weeks or months, ulceration occurs.

Gummatous Lesions.—The syphilitic gumma is usually a late manifestation of the disease. Frequently, however, it may occur very late in the secondary period. Generally it is present as one or several painless or slightly painful, rounded or flattened, more or

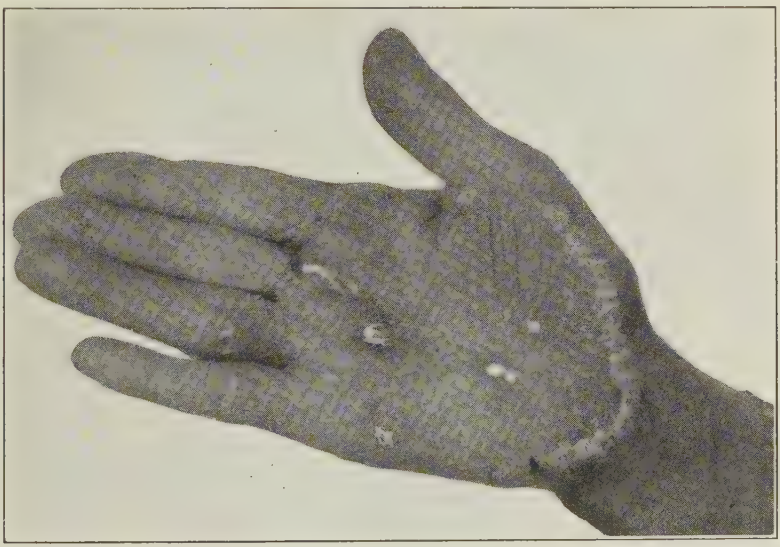


Fig. 139.—Late squamous syphiloderm.

less circumscribed tumors, moderately raised above the surface of the skin, at first firm, and situated in the subcutaneous tissue. They may be slow or rapid in growth. As the tumor grows the overlying skin is stretched and changed to a pink or reddish, gradually becoming a dark red color. The tumor becomes soft and doughy, tending to break down and ulcerate. Usually the ulcer resulting is "punched out," and shows a tendency to be kidney-shaped. The favorite sites for the gummatous lesions are the soft parts, particularly of the thigh and calf. Any region, however, may be attacked.

Unusual Eruptions.—Several unusual syphilitic eruptions should be mentioned. In the negro race the secondary eruption tends to

take an annular or *circinate type*, forming distinct rings, chiefly around the mouth, forehead, and the neck. This form is frequently associated with the usual types of eruption on the body. At times, however, this annular eruption, limited to the face, is the only one seen, although probably a macular outbreak preceded the same. The *annular syphiloderm* is rare in the white race.

FIG. 140.—Syphilis, gummatous type.

Two rare forms of syphilis which supposedly occur are the *vesicular* and the *bullous;* only a few of these cases have been reported, and some authorities are somewhat skeptical as to their occurrence. In these types the lesions are either all vesicular or all bullous, no other type of eruption being present.

The *pigmentary syphiloderm* is another rare form of eruption. It is essentailly a macular eruption, not hyperemic like the ordinary type, but pigmentary in form. It usually occurs early in the secondary period but at times late in the disease. The neck and shoulders

FIG. 141. Syphilitic gumma.

FIG. 142.—Destruction caused by a syphilitic gumma.

are the usual areas attacked. Taylor has classified this type under three headings: (1) As variously sized brownish patches; (2) more or less diffused brownish discolorations, which become milk-white in color and tend to spread as such; (3) an abnormal or uneven

Fig. 143.—Destruction from syphilitic gumma.

Fig. 144.—Syphilis (late squamous eruption of the palm).

FIG. 145.—Late squamous syphilitic eruption.

FIG. 146.—Annular papular syphilis. (Courtesy of Dr. Howard Fox.)

distribution of pigment, the surface having a mottled appearance. The second form is the most usual.

The *corymbos syphiloderm* consists of an unusual character of grouping of the papular type. This is characterized by a slightly larger central papule surrounded by a group of smaller satellite papules. The grouping at times is distinctly circular, or at times somewhat irregular. *Erythematous*, *purpuric*, and *erythema-multiforme-like* eruptions have also been observed in syphilitic cases.

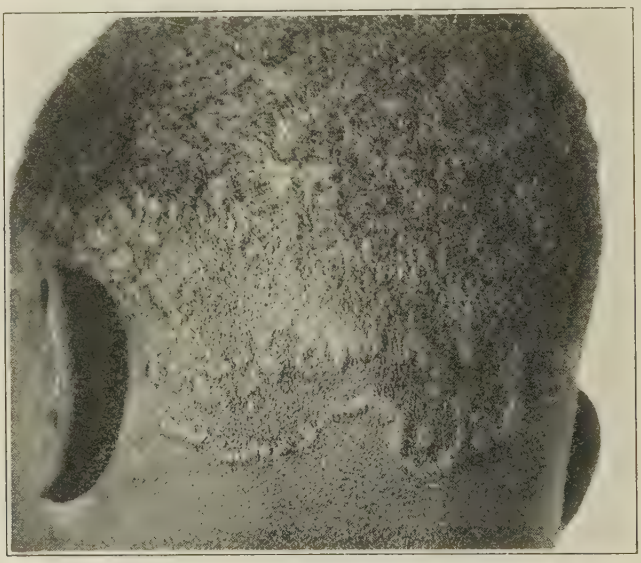


Fig. 147.—Syphilis (annulo-papular type).

Hereditary Syphilis.— In a syphilitic pregnancy the fetus may be aborted, born dead, or at the time of birth the infant may show an eruption, but frequently the outbreak does not develop until three to six weeks after birth, or within the first six months of life. The infant's skin at the time of birth may show a dull earthy tint and is shrunken, so that the face resembles that of a little weazened old man. The infant has a marked rhinitis. The well-known and characteristic "snuffles" prevents nasal breathing and nursing from the breast or bottle is difficult. The child frequently begins to lose weight and becomes somewhat pale and fretful. At about the same time as the development of these symptoms, a generalized dark red or ham-colored maculo-papular eruption appears, which is frequently even more profuse upon the palms, the soles, the face, the neck, and the genitalia than in the acquired disease. The lesions about the anus, the genitalia and the adjacent folds frequently become

abraded and moist, forming moist papules (*mucous patches*), and showing a tendency to a *condylomatous* formation in the anal region. *Mucous patches* are frequently seen in the mouth and on the lips.

The outbreak may start as an erythematous or *macular* eruption which is mostly observed in the genito-crural region. Fissuring, abrasions, and ulcerations are marked features of the disease, at the commissures of the mouth, on the mucous membranes of the lips, and surrounding the anus. The eruption may also at times consist of *flat papulo-squamous* lesions, but the types just mentioned are most often seen. *Pustular* lesions are of unusual occurrence.

Fig. 148.—Congenital syphilis, annular papular type. (Courtesy of Dr. Howard Fox.)

Bullous lesions are of frequent occurrence in severe instances of hereditary syphilis, associated with a macular and papular eruption. Bullous lesions are more or less generalized, with a predilection for the palms and the soles. They are generally flaccid, sometimes distended, often surrounded by a coppery ring of infiltration, and are seated upon an excoriated, eroded, or ulcerated base. *Tertiary* lesions of the *nodular* or *gummatous* types are rare; the former may occur as early as the sixth month, sometimes after years have elapsed; and the latter occasionally develop after the child has reached the age of three or four years. Lymphatic gland enlargement is either absent or present in only a mild degree.

Syphilitic dactylitis is usually observed during the early months of the disease, occasionally at a later period. It is persistent and characterized by a considerable amount of swelling which tends to break down. Rarely an inflammation of the nail or surrounding tissues develops.

FIG. 149.—Gumma of a girl, aged five and a half years.

In the later manifestations of the disease *Hutchinson's triad* may be present, consisting of a notched malformation of the incisor teeth, interstitial keratitis, and deafness.

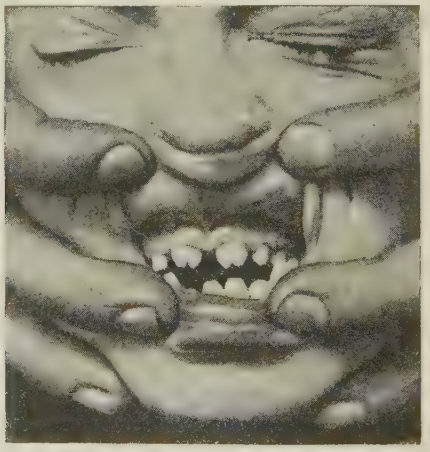


FIG. 150.—Hutchinson's teeth. (Taylor.)

Etiology.—Syphilis is either acquired or hereditary. The disease is acquired in almost 95 per cent of the cases in the genital region and in almost all of these instances by intercourse. In approximately 5 per cent of cases the infection is inoculated extragenitally.

Extragenital lesions in the great majority of instances are acquired accidentally and, with probably but few exceptions, innocently. In a very large proportion of cases there is but one site of inoculation and therefore but one initial lesion. An *extragenital lesion* is acquired either by direct contact with the secretions of a syphilitic lesion or with blood of a luetic individual, and also indirectly from contact with some object containing the same. Infection occurs through kissing, drinking cups, glasses, the common communion cup, infected razors, tattooing, various instruments and implements, in professional men from the pursuit of their profession, and by other means too numerous to mention. Apparently some break in the skin or mucous membrane surface, no matter how trivial, is essential for inoculation to occur. Unnatural sexual relations have been causal in a few instances on the lips or within the mouth.

Pathology.—The cause of syphilis is the *Spirochæta pallida* (Treponema pallidum), which was discoverd by Schaudinn and Hoffmann in 1905. This organism is an extremely delicate filament, coiled to form a grayish spiral, and has almost the same refractive index as the medium in which it is placed; hence the former difficulty in its recognition. The spiral arrangement is maintained not only during movement but also in the state of rest. The movements are very slow compared with the other spirochetes. According to the discoverers it varies in length from four to fourteen microns. The undulations or twists of which the organism is composed average twelve; ten to twenty-six (Schaudinn). The structure is apparently of a homogeneous character, and there is no undulating membrane. The life history of the organism has been studied by McDonagh[1] and is exceedingly complex.

Spirochæta pallida lose their characteristic movements outside of the body in from five to six hours. Motility in the tissues, according to Jacquet and Sezary, is maintained for less than twenty-six hours after the patient's death; Levaditi found them all motionless in the liver of a congenitally syphilitic thirteen hours after death. The organisms lose their motility at a temperature of 45° C. (Landsteiner and Mucha), and 51° C. completely destroys the virus of syphilis.

Cultivation of the organism has proved very difficult. Levaditi and McIntosh have obtained an impure culture in collodion sacs by an elaborate process.

Location of the Spirochæta Pallida: Primary Lesion.—The serous discharge from an untreated chancre contains, as a rule, a large number of spirochetes, and they can be demonstrated at its earliest

[1] British Jour. Derm., 1913, p. 1.

appearance. They are very difficult to find in a primary sore over eight weeks old, possibly due to their destruction by the granulomatous tissue.

Lymphatics.—*Spirochæta pallida* are found in the lymph channels leading from the primary sore. They are found most numerously in the connective tissue forming the trabeculæ of the gland and in the perivascular tissue.

Secondary Lesions.—The organism of syphilis spreads by the lymph channels and the vascular system. The organisms are present in two locations—the deeper layers of the epidermis and surrounding the capillaries of the papillæ. A secondary syphilitic rash is the result of the invasion of the deeper layer of epithelial cells.

Blood.—The blood of syphilitics is at least not infectious to a marked degree. Hoffmann found that the blood was infective before the rash appeared and for six months following the appearance of the eruption.

Tertiary Lesions.—These lesions are infective, although the syphilitic organisms are rarely found. Most investigators have failed to find the organism of syphilis or have proved the infective properties of the urine, the spermatic fluid, the cerebrospinal fluid, and the milk of individuals with syphilis.

Congenital Syphilis.—*Spirochæta pallida* have been found in large numbers in all of the lesions of early congenital syphilis. In practically every case of infantile congenital syphilis the organism can be demonstrated in the internal organs.

Histopathology of Syphilitic Lesions.—The primary sore consists of a cellular infiltration, with swelling of the connective-tissue elements. The epidermis is the seat of a leukocytic and fibrous infiltration. The vessels are inflamed.

The papular lesions consist of a cellular infiltration around the vessels which is made up of a large collection of small round cells, plasma cells, lymphocytes, fibroblasts, and an occasional giant cell. There is a marked inflammation of the bloodvessels and endarteritis of the smaller vascular channels. The epidermis is thickened in the scaly eruptions, edematous and infiltrated in the other forms, and degenerated in the superficial ulcerative variety.

There is inflammation of the small vessels in the tertiary varieties. The gumma starts with a venous thrombosis in the subcutaneous tissue, and later there is a marked cellular infiltration, with softening and liquefaction.

The vegetative forms show hypertrophy and infiltration of the corium; ulcerative lesions exhibit necrosis and destruction of the epidermis and true skin. The greater the increase of connective tissue the harder the lesion.

Experimental Syphilis. -Present-day knowledge of experimental syphilis is due to the brilliant researches of Metchnikoff and Roux, and later of A. Neisser, Hoffmann, Finger, Landsteiner, Kraus, Siegel, Bertarelli, and others. Various animals have been successfully inoculated with the syphilitic organism. The anthropoid apes, particularly the chimpanzee, because of their close resemblance to man, are the most susceptible to the virus of syphilis. There is a primary lesion, somewhat smaller than in the human individual, secondaries, but no tertiaries. Other anthropoid apes, such as the orang-outang and gibbon, are almost as susceptible to the syphilitic virus as is the chimpanzee. The disease is, however, less typical; the primary lesion is smaller and a secondary eruption is unusual. Although the lower monkeys can be inoculated, the primary lesion is insignificant and there are no secondaries.

Bertarelli has succeeded in inoculating rabbits with syphilis. The disease has not only been communicated from the human being to the rabbit, but from rabbit to rabbit, and from the rabbit to a monkey or guinea-pig. A local lesion alone has been observed.

Special Methods of Diagnosis. Demonstration of the Spirochæta Pallida.—There are four different ways by which to demonstrate these organisms: (1) By the dark-field illuminator; (2) by staining the secretions from active lesions; (3) by the India-ink method; (4) by staining the organisms in the tissues.

Dark-field Illuminator Method.[1]—This method affords the best means of demonstrating the organisms, for the trained observer cannot miss them provided they are in the serum. With this method an absolute and early diagnosis of syphilis can be made in a very short time. A lesion that has been treated with strong antiseptics will very often fail to show the organisms; in such cases the patient should be advised against the use of local applications for a day or two, and at the end of which time another examination should be made. In making examinations of lesions in the mouth, serum should be obtained from deep in the lesion, for there are spirochetes in the mouth that closely resemble the organism of syphilis.

The apparatus required consists of a microscope with a good oil immersion lens with a rubber funnel diaphragm screwed in just above the lens, a dark-field illuminating condenser, which takes the place of the ordinary substage condenser, and a powerful light with a biconvex lens.

The suspected lesion is gently cleansed with sterile normal saline solution, using enough pressure to cause serum to exude. Care should be exercised to avoid drawing blood, as the field is

[1] Indebtedness is acknowledged to my associate, Dr. Abram Strauss, for assistance in the preparation of this section.

very often obscured in the presence of much blood. A clear serum is drawn up with a pipette and placed on a thin cover-slip. This is placed on a thin slide and air bubbles expressed. A drop of immersion oil is then placed on the dark-field and the slide pressed against it and another drop of oil put on the cover-slip. After focusing the light the examination is made in the same way as other oil-immersion examinations. The opaque stop in the dark-field cuts off the direct rays of light, the peripheral rays being focused so that they will strike the top of the glass slide, illuminating all objects brilliantly against a dark background. In the well-prepared specimen small white motile bodies will be seen, which are very active, and moving slowly across the field will be seen the spiral organism of syphilis.

Fig. 151.—Spirochætæ pallida stained by India ink (Burri method). (Park.)

India-ink Method.—Burri utilizes the fact that all the particles suspended in India ink will, when the latter is spread out in a thin film, show up as a clear space against a dark background. Thus the organism of syphilis appears as a white, undulating thread, while the thin film of ink appears yellowish or gray-brown. The microbes in the ink must be destroyed by steaming. The ink is well centrifuged and kept in a corked test-tube. The upper portion only is employed. One platinum loop or one part of suspected exudate is placed at one end of a clean microscopical slide and is then mixed with one loopful of ink. This mixture is spread in a thin film along the slide and dried without heat. No fixation is

required nor is it necessary to use a cover-glass. Examination with an oil-immersion lens will reveal the *Spirochæta pallida*.

Levaditi Method.—This method has proved satisfactory in the demonstration of the organism in the tissues.

1. Fix fragment of the tissue not thicker than 1 to 2 mm. in a 10 per cent solution of formalin for twenty-four hours.
2. Wash in water and transfer to alcohol, 96 per cent, for twenty-four hours.
3. Wash in distilled water until the piece of tissue falls to the bottom of the jar.
4. Impregnate for three to five days at 38° C. in a 2 per cent solution of silver nitrate in the dark.
5. Wash in water and reduce over night in the following bath: Pyrogallic acid, 4 gm.; formalin, 5 cc; distilled water, 91 cc.
6. Wash in water, dehydrate, and imbed in paraffine in the usual way.
7. Cut the sections not thicker than 5 mm. and mount in Canada balsam.

Luetin Reaction.—Noguchi has suggested the injection into the subcutaneous tissue of a small quantity of a killed culture of *Spirochæta pallida* as a diagnostic test, but as its action depends on an established anaphylaxis, which usually takes a considerable time to develop, the test does not become very dependable until the late stage of the disease. This so-called luetin reaction is done by injecting 0.1 cc of the suspension directly under the skin of the arm so that a wheal is produced and an equal quantity of the sterile culture medium is injected below this as a control. The reaction usually takes place at the end of twenty-four hours and reached its height in two or three days. The following type of reactions are observed: Negative, papular, pustular, hemorrhagic and delayed. A negative reaction is manifested by the disappearance of the wheal in a short time or the appearance of a macule which disappears in less than three days. The papular reaction is usually surrounded by a bright red areola and usually subsides at the end of a week, leaving behind in most instances some pigmentation. The pustular reaction commences as an ordinary papule with a formation of vesicles which later become pustular. There is usually pain and itching in this type. The delayed reaction shows no change at first but gives a typical reaction in about four weeks. The hemorrhagic form is rare and runs the same course as the pustular one.

The reaction is sometimes accompanied by systemic symptoms, such as fever, headache and malaise.

The luetin reaction is much more marked in those who have had treatment and in individuals who are definitely non-syphilitic

a positive reaction can be obtained in a large percentage of cases if the individual has previously taken potassium iodide or other drugs containing iodine. From these facts it is evident that the luetin reaction has a very limited definite significance.

Howard Fox found in 100 cases of syphilis that the test was positive in 43 per cent of the secondary type and in 51 per cent of the tertiary variety.

Wassermann Test.[1]—The complement-fixation test formulated by Bordet and Gengou, as applied to the diagnosis of syphilis by Wassermann, Neisser, and Bruck, with its numerous refinements of technic during the past decade, constitutes one of the most important diagnostic aids in the recognition of syphilis. The test depends upon a certain specific substance (lipoidal in character) which is in the blood serum of persons infected with syphilis. This lipoidal substance, or amboceptor, is capable of uniting with the complement and antigen. This phenomenon is termed fixation of the complement.

In the performance of the test, guinea-pig blood serum is used to furnish the complement. The natural complement in the patient's serum is rendered inert by heating the blood serum to 56° C. for thirty minutes. This procedure is termed inactivation of the serum. The antigen is an extract of syphilitic or non-syphilitic organ.

When these three substances, properly prepared and mixed in correct proportions, are permitted to remain in contact for a definite period of time (depending upon whether refrigerator or water-bath incubation is used) union takes place. This is termed the first step in the complement-fixation test. It is a matter of common knowledge that the materials used in this step are colloid suspensions and therefore show no apparent visible change at the end of this period. In the next step a hemolytic system or indicator is added. For this purpose an antigen (a suspension of human, sheep, or ox red blood cells in salt solution) and an amboceptor (blood serum from a rabbit immunized against the particular cells used) are employed. These two substances are added to those mentioned and allowed to remain in contact for another period. This is the second or final step in the test.

If the patient's serum contains the syphilitic amboceptor, the complement and antigen are fixed during the first period and therefore the complement is not free to unite with the antigen (red blood cells) and amboceptor (specific against the type of red blood cell) in the hemolytic system or indicator. On account of this fixation of the complement there is an inhibition of hemolysis

[1] Indebtedness is acknowledged to my associate, Dr. Henry B. Decker, for assistance in the preparation of this section.

during the second period. If the inhibition is complete the test is read as + 4, or strongly positive, so on down until we reach a slight inhibition which is termed + 1, or weakly positive. On the other hand, if the patient's serum does not contain syphilitic amboceptor the complement is not fixed during the first period and is free to combine in the hemolytic system and cause hemolysis of the red blood cells during the second period. The hemoglobin diffuses out of the red blood cells and colors the fluid red. This is read as a negative reaction.

It must be remembered that certain sera, especially those which have remained in contact with the clot for a considerable period of time, or which have become infected, frequently possess the power of fixing, regardless of the presence of the syphilitic amboceptor. This anti-complementary or false reaction can be detected by proper controls (which are made during the test). The complement-fixation test should never be relegated to lay technicians unless it is supervised and controlled by trained and competent medical serologists.

The exact percentage of positive reactions obtained during the first stage of syphilis is still an academic question. The production of syphilitic amboceptor in the patient is a response of tissue to combat the invading organisms, so it should be obvious that a positive reaction is more likely to be present after the chancre has existed for several weeks than when it has been present for only a few days. At some time during the presence of the first stage or shortly thereafter the test is usually positive, so that during the secondary eruption over 95 per cent of the cases give a positive result. In the tertiary stage, with the areas walled off by fibrous tissue, fewer cases show a positive reaction. The percentages given are between 80 and 85.

Certain conditions other than syphilis will give a positive complement-fixation test, namely, yaws, malaria, during the febrile stage, and leprosy, especially the nodular form. A number of other conditions, such as scarlatina, pneumonia, tuberculosis, and malignancies, have been reported as producing a positive reaction by some authorities and denied by others. A diagnosis of syphilis cannot be based upon a single weakly positive test, especially if the blood is taken from a patient during an acute febrile disease. Blood should not be taken from patients under the influence of chloroform or ether anesthesia, as frequently a positive complement-fixation test is obtained.

Drinking of alcoholic beverages for a few days before blood is taken will convert a positive reaction into a negative. A single negative test does not mean necessarily that a patient does not have syphilis, but that the blood serum at that particular time

responded negatively to the complement-fixation test. If the clinical symptoms warrant, a second or even a third examination of the blood should be made before any definite opinion can be given as to the diagnosis of such a case.

Cerebrospinal Fluid.—A routine examination of the cerebrospinal fluid of every patient before final discharge as cured is indicated. The fluid is obtained by lumbar puncture, under aseptic conditions, with a special needle, from the vertebral canal usually between the third and fourth lumbar vertebræ. From 10 to 15 mm. are withdrawn. Increased pressure of the fluid is frequently observed and may be measured by a special manometer or the force with which it flows from the needle.

The fluid is examined immediately for its globulin and cell content. Globulin is increased in syphilis of the nervous system, and is occasionally increased in non-syphilitic conditions.

The normal cell count of 5 to 10 per cubic millimeter may be increased up to 100 in general paresis and cerebral syphilis, and as many as 1000 cells have been recorded in syphilitic meningitis. In tabes the count varies, usually being increased during the acute stage of the process and diminished after the degeneration takes place.

The percentage of lymphocytes should be determined by differential staining. A high percentage indicates an active and recent meningeal irritation, while a low percentage of lymphocytes is indicative of a quiescent or degenerated tissue change.

The spinal fluid is tested for the complement-fixation reaction. The spinal fluid is not inactivated because it contains no natural complement, however varying amounts are used, usually from 0.2 to 1 cc.

Diagnosis.—Syphilis has to be distinguished from several diseases depending upon the stage of the disease and the type of eruption present.

The *initial lesion* when located on the genital region has to be chiefly differentiated from chancroid, and also occasionally from herpes:

Chancroid.	Chancre.	Herpes Simplex (Fever Blister).
Incubation period, three days.	Incubation period, three weeks.	No incubation period.
Lesion is soft, non-indurated.	Lesion hard, densely indurated.	No induration.
Lesion is raw, red and the surface is covered with a profuse discharge; non-elevated, or very slightly raised.	Very little oozing from the surface; smooth, crusted, or papillomatous, elevated and frequently button-like.	Groups of vesicles on an inflamed base, which break and dry up into a crust in a few days, and disappear spontaneously.

Chancroid.	Chancre.	Herpes Simplex (Fever Blister).
Usually several lesions present, frequently when the surfaces are more or less in contact from auto-inoculation.	Usually but one lesion present; not auto-inoculable.	Usually but a single group of vesicles present.
Inguinal glands frequently, on only a single side, are enlarged and inflamed; glands frequently fluctuate and break down.	Inguinal glands on both sides are enlarged, non-inflamed and do not break down; later a general glandular enlargement.	Usually no glandular enlargement.
Spirochæta pallida not present in lesions.	Spirochæta pallida present.	Spirochæta pallida absent.
Blood test negative.	Wassermann test positive in a large percentage of cases.	Blood test negative.
No general eruption.	General eruption in six weeks, and the various concomitants of syphilis.	No general eruption.

When the chancre is extragenitally located the characteristics just mentioned readily excludes an epithelioma, abscess, or a blind boil.

The *macular eruption* of syphilis has to be particularly distinguished from *pityriasis rosea*. The latter starts with a very superficial pinkish lesion with a slightly scaly fawn-colored center. Three or four days to a week or ten days later numerous lesions, a dime to a quarter-dollar in size, of the type of the original lesion, develop on the trunk and the upper portions of the extremities. The disease runs a course of from three to six weeks, is accompanied usually by slight or rather marked itching, and disappears spontaneously. The syphilitic eruption is generalized, attacking markedly the palms and the soles; there are also papules present, no itching, the disease does not disappear spontaneously, there is an initial lesion present, general glandular enlargement, and various concomitant signs of the disease.

The *papular variety* is distinguished from *eczema* by the intense itching of the latter, the lack of the plantar and palmar involvement. The eruption is not so generalized, and the glandular enlargement and various concomitants are absent. *Lichen planus* is usually fairly localized, particular on the flexure surface of the wrists, the forearms, and the ankles, and the lesions are shiny, irregularly shaped papules of a violet color. The *papulo-squamous type* is differentiated from psoriasis and seborrheic dermatitis. *Psoriasis* tends to attack the extensor surface of the extremities and the scalp, and even in the somewhat generalized cases the palms and soles are not attacked, and the face, if involved, shows but a few lesions. The patches are not covered with the yellowish-brown

scales as in syphilis but with those of a silvery-white color. There is no glandular enlargement or other signs of constitutional involvement. *Seborrheic dermatitis* is characterized by reddish patches covered with greasy yellow scales, and the sites of attack are the scalp, the alæ of the nose, the sternum, between the shoulders and the hairy regions. Palms and soles are not attacked and there is no constitutional involvement.

The *pustular syphilitic eruptions* are to be distinguished from acne, bromide and iodide outbreaks, smallpox, and ecthyma. *Acne* is characterized by papules, pustules, blackheads, and sebaceous cysts which are usually most marked upon the face, and also upon the backs and shoulders, and only exceptionally elsewhere; there are no constitutional symptoms or glandular enlargement, and the palms and soles are never involved. The *drug eruptions* from the ingestion of the iodides or the bromides are usually not generalized but chiefly involve the face, the back, and the chest. There is a history of taking one or the other drug, and there are no constitutional symptoms excepting those due to the effect of the drug, and the glands are not enlarged. *Smallpox* runs an acute course, with marked constitutional symptoms, without the presence of mucous patches or an initial lesion, and the lesions run through a papular and then a pustular stage. *Ecthyma* is usually confined to the legs; there are usually but a few lesions present, and the male sex, particularly the uncleanly, are prone to the outbreak. The palms and soles are rarely attacked, and there is no general glandular enlargement or other signs of constitutional involvement.

The *gumma* of tertiary syphilis, if it occurs upon the lower leg, has to be distinguished from erythema nodosum and an abscess. *Erythema nodosum* runs an acute course, is usually symmetrical in distribution, limited to the tibial region, and does not break down. Gumma is usually one-sided, runs a longer course, tends to break down, forming a kidney-shaped ulcer. An *abscess* runs an acute course, and when it breaks forms an irregular ulceration. The *nodular type* of syphilis should be differentiated from tuberculosis (lupus vulgaris) and epithelioma. *Lupus vulgaris* develops in early life, usually under puberty, is very slow in growth, attacking in most instances the face; the patch is made up of reddish-brown, deep-seated tubercles, which after a considerable period break down and form an irregularly shaped ulcer. There are often other signs of tuberculosis present and the tuberculin tests are positive. *Epithelioma* develops after the age of forty, runs a comparatively slow course, and has a rolled, pearly border, and bleeds readily. The ulceration is somewhat punched out. Tertiary syphilis runs a fairly rapid course and is apt to develop in

early or middle adult life. The nodular form consists of dark red nodules which group in the form of a segment of a circle; the ulceration has a segmental or kidney shape, the outline of the patch is serpiginous, and the Wassermann test in a large percentage of cases is positive.

Hereditary congenital syphilis is to be chiefly distinguished from bullous impetigo. *Bullous impetigo* does not tend to attack the palms and the soles, is not accompanied by mucous patches or fissures at the corners of the mouth or in the anal region. There is no constitutional involvement except in the fatal cases. Bullæ are alone present, and there are no "snuffles."

Prognosis.—Syphilis is rarely seen of such a malignant type as formerly and therefore there are no fatalities in the disease, except when a vital organ is involved or in poorly nourished infants with the hereditary variety. There are a considerable number of stillbirths in the offspring of syphilitic parents. Most syphilitic eruptions disappear readily under proper treatment, but medication has to be continued for a long period, as relapses are frequent. The late palmar eruptions of the squamous type are particularly resistant to medication. The Wassermann test is extremely helpful in determining the temporary or permanent eradication of the disease.

Treatment.[1]—The patient with syphilis should be thoroughly warned of the contagious nature of the malady. Kissing should be avoided and every article or implement that has touched the secretion of a syphilitic lesion should be carefully guarded against contact with another individual. Therefore the patient should use an individual knife, fork, spoon, plate, drinking-glass, towel, and soap.

If the patient is in poor physical condition plenty of good, easily digested food should be taken. Moderate exercise, outdoor life as far as it is feasible, and tonic treatment may be indicated.

The drugs which are used in the eradication of the lesions and the cure of the disease are mercury, potassium or sodium iodide, and arsenic (arsphenamine or neoarsphenamine).

Treatment should be started as soon as the disease is diagnosed. Formerly it was necessary to wait for the appearance of the secondary eruption in order to diagnose the disease, but smears may now be made from the initial lesion and with the demonstration of the *Spirochæta pallida* therapeutic measures may be begun immediately.

The disease may be prevented if the site of exposure to syphilitic inoculation is thoroughly rubbed, within twelve hours, with the official ointment of mercury or with an ointment of calomel.

[1] Indebtedness is acknowledged to my associate, Dr. Abram Strauss, for assistance in the preparation of this section.

Mercury.—Mercury is one of the oldest drugs used in the treatment of syphilis; it has a selective action on the spirochete. Without a doubt it should be employed in conjunction with arsphenamine, either alternating with the injections of arsphenamine or following a course of arsphenamine.

Mercury is eliminated by the saliva, sweat, bile, milk, urine and feces, but has a tendency to remain in the body for a long period of time. Mercury has a great affinity for the kidney cells, the kidneys being the first organs involved in mercury poisoning.

Methods of Administration.—The methods most frequently employed for the administration of mercury are by mouth, by inunction and by injection. Administration by inhalation, fumigation and suppositories is rarely employed.

Mercury given by the mouth has the advantage of being very convenient for the patient; it is, however, the least effective of the three methods. It should only be employed where inunctions or injections cannot be given. The most popular preparations are the bichloride and the protiodide. The protiodide is given in $\frac{1}{4}$-gr. doses three times a day, and if well tolerated by the patient the dosage may be increased. The bichloride is given in $\frac{1}{24}$ to $\frac{1}{16}$-gr. doses. Gray powder, blue mass, calomel and salicylate of mercury are some of the other preparations that may be employed.

Administration by Inunction.—This method is very effective if properly carried out, but most patients object to the annoyance of properly carrying it out. The preparation usually employed is the unguentum hydrargyri, put up so that 1 dr. of the ointment may be used by the patient for each inunction. The following directions are given the patient: The part chosen for inunction should be washed with soap and water. The first night rub the ointment into the inside of the right thigh; the second night, into the inside of the left thigh; the third night, into the abdomen; the fourth night, into the inside of the right arm; the fifth night, into the inside of the left arm; and on the sixth night, returning again. Rubbing should continue for from twenty to thirty minutes, and the excess ointment is removed with benzine. Care must be exercised not to rub the ointment into hairy parts as a pustular dermatitis is liable to result.

Administration by Injection.—Two classes of mercury are used for injection, the soluble and the insoluble. The soluble preparations, such as the bichloride, the benzoate and the cyanide, are absorbed very quickly and are used in those cases where an immediate effect is desired. The insoluble preparations, such as gray oil, calomel, and the salicylate, form a nucleus of mercury in the tissues and are very slowly absorbed. For this reason they are better suited for general routine treatment. In the Jefferson

Hospital Clinic we employ as routine the salicylate of mercury, and our results have been uniformly excellent. We use an oily suspension put up in ampoules, each ampoule containing 1 gr. of mercury salicylate. An all glass 2 cc Luer syringe with an 18-gauge needle is sterilized by boiling and the contents of the ampoule drawn up into the syringe. The upper portion of the gluteal muscle is preferred as the site of injection. The part is cleansed with alcohol and the needle quickly plunged at right angles into the muscle. The plunger is then withdrawn to make sure that the needle has not entered a bloodvessel and the injection is slowly made. This should be followed by injection of air to force all the mercury out of the needle. The needle is then rapidly withdrawn and the part massaged. Injections are given every fifth to seventh day until eight to twelve have been given.

Intravenous injection offers the quickest way of getting mercury into the system, but has the great disadvantage of causing phlebitis and must be given at short intervals to get a sustained effect. The bichloride, $\frac{1}{20}$ gr., the cyanide, $\frac{1}{6}$ gr., and the benzoate, $\frac{1}{2}$ gr., are the preparations most frequently employed.

Administration of Iodides.—It should be remembered that the iodides are only an adjunct in the treatment of syphilis, as they only have the power of absorbing diseased and broken-down tissues. They do not have the power of killing the *Spirochæta pallida*. Their use is limited to the late, or tertiary stage of the disease. Moderate doses should be used and in most instances 10 gr. of potassium iodide or sodium iodide given three or four times daily will suffice.

Administration of Arsphenamine and Neoarsphenamine.—Arsenic has a destructive effect upon the various spirochæta, including the Spirochæta pallida. Ehrlich and Hata introduced for the treatment of syphilis, under the title of salvarsan (arsphenamine), the so-called "606," dioxy-diamido-arseno-benzol. Two theories have been brought forward for the curative action of this drug: (1) That it has a direct destructive action on the spirochætæ; and (2) that antibodies are developed as the result of the injection and that these destroy the virus.

It was originally hoped that one dose would eradicate syphilis, but it is now definitely determined that several injections and a mercurial course are necessary for the eradication of the disease.

Contraindications to the Use of Arsphenamine or Neoarsphenamine.—When arsphenamine was first introduced there was a long list of conditions in which it was thought to be contraindicated. Pregnancy and high blood-pressure, syphilis of the central nervous system, diseases of the circulatory system, and tuberculosis were considered contraindications for its use. We do not hesitate at

present to employ the drug; in fact, we use the drug where these conditions exist without any hesitancy.

In acute nephritis harm is manifested by the presence of red blood cells and an increased amount of albumin in the urine; in chronic nephritis it can be used with care—where the nephritis is due to syphilis considerable benefit results.

Some individuals do not tolerate the drug well, which is shown by increasing reactions with successive injections and loss of weight.

In cases where there has been a dermatitis, the drug should be discontinued for a period of six months to a year.

Neoarsphenamine seems to be better tolerated than arsphenamine, and is less toxic; but the contraindications are the same.

Administration of Arsphenamine.—The dose of arsphenamine is determined mainly by the body weight of the patient. Assuming that all other factors, such as the heart, lungs, kidneys, and liver are normal, 0.1 gm. is given for each 25 or 30 pounds of body weight. For the average male patient the dose is 0.6 gm. and for the female 0.45 gm.

Preparation of Drug.—After the ampoule of arsphenamine has been immersed in alcohol to make sure it is unbroken, it is opened with a sterile file and the contents poured into a flask containing about 30 cc of sterile distilled water which has a temperature of about 70° F. The flask is vigorously shaken until the drug is completely dissolved. A 15 per cent solution of sodium hydroxide is then added drop by drop until the solution precipitates, when by the addition of more of the alkali the precipitate disappears and the solution becomes clear. It is then filtered through gauze into a clean container. It is now ready for injection. A graduated container is used, to the lower end of which is attached a rubber tubing of small bore. A glass tube may be inserted in the lower third of the tubing so that the presence of air and the color of the solution can be noted. The choice of the type of needle, whether gold, platinum or steel rests with the individual operator, but we have found that a good sharp steel needle of about 18-gauge will answer every requirement.

Technic of Injection.—The graduated container is suspended about 3 feet above the table on which the patient is to be placed. It is then filled with 50 cc of sterile distilled water and the air expressed from the tubing. The patient is placed on the table in a recumbent position and the site for injection—preferably the elbow—swabbed with iodine followed by alcohol. A tourniquet is placed above the bend of the elbow tight enough to cause engorgement of the veins. By slapping the arm and advising the patient to make a tight fist the veins will become more prominent. Holding the needle parallel with the course of the vein it is plunged through

the skin and then inserted directly into the vein. When in the vein, as evidenced by return flow of blood, the tourniquet is removed, the patient advised to open the fist and the rubber tubing is attached to the needle. Sufficient water is allowed to flow in to make sure there is no leakage outside the vein. The solution of arsphenamine is now poured into the container and allowed to flow in slowly, from five to fifteen minutes being consumed in the operation. When the solution is almost out of the container, sterile water should be added so as to carry all the drug out of the tubing needle. The needle is then withdrawn and flexible collodion applied over the site of injection.

Administration of Neoarsphenamine.—The dosage of neoarsphenamine is one-third to one-half more than that of arsphenamine.

Preparation of the Drug.—The ampoule is immersed in alcohol and the top filed off. The contents are poured into 5 or 10 cc of sterile distilled water, room temperature, and allowed to dissolve. The solution is filtered and drawn into a sterile all-glass Luer syringe to which is attached a 22-gauge needle.

Technic of Injection.—One of the great advantages of neoarsphenamine is its ease of administration as compared to arsphenamine. Smaller veins can be used for injections, there is less time consumed in giving it, and less chance of causing local reactions due to leakage. Any vein is chosen, preferably those at the bend of the elbow. The skin is swabbed with iodine followed by alcohol. All air is expressed from the syringe and the needle plunged through the skin, parallel with the course of the vein. It is then pushed into the lumen of the vein, the plunger of the syringe withdrawn and 2 or 3 cc of blood allowed to flow back into the syringe. The drug is then slowly injected, the needle withdrawn and flexible collodion applied over the site of puncture.

The dosage of *silver arsphenamine* is approximately half as great as that of arsphenamine. The preparation and technic of injection is the same as for neoarsphenamine.

Ill-effects from Arsphenamine and Neoarsphenamine.—These can be grouped into two main classes: The effects of the drug before absorption and the effects after absorption. Besides this we must discriminate between the drug properly prepared and administered and one improperly prepared and administered. When the injection is given so that there is leakage of the solution into the surrounding tissues, there are degrees of local reaction varying from a slight inflammation with induration up to a severe inflammation with necrosis. Improperly prepared or spoiled solution give rise to grave symptoms which are sometimes fatal. The immediate reactions are shown by symptoms of vaso-dilatation or vaso-paresis. This may occur while giving the injection or

immediately following. The patient usually complains of a disagreeable taste, and the face becomes flushed. Some shortness of breath with pain in the precordial region is noted. The pulse becomes rapid and weak. These symptoms usually last from two to ten minutes and the patient is relieved. At times vomiting may occur during the injection.

These effects can often be ameliorated or overcome by the use of adrenalin solution, 1 to 1000, either by hypodermic or by placing a few drops under the tongue just preceding the treatment. By withdrawing an equal amount of blood into the syringe with neoarsphenamine, then injecting 1 cc of the solution and resting one minute before injecting the remainder, immediate reactions are often overcome.

One to twenty-four hours following the injection, various unpleasant symptoms are observed. Headache, depression, nausea, vomiting and diarrhea with intestinal pain, with sometimes a chill and elevation of temperature are symptoms observed with varying degrees of intensity in different individuals. One must not lose sight of the fact that some preparations of the drug are more toxic than others.

Delayed reactions are those which come on several days after the injection and are usually of serious importance. They may be gastro-intestinal, cutaneous, or may be manifest by cutaneous eruptions or encephalitis.

Further administration of the drug in these cases should be discontinued for from six months to a year.

The Jarisch-Herxheimer Reaction.—In certain cases the pathological and clinical symptoms are exaggerated following the injection of arsphenamine. The lesions usually become brighter and some swelling is noted. Observers believe that this is due to a liberation of endotoxins from the spirochetes killed by the arsphenamine.

Postarsphenamine Dermatitis.—The cutaneous manifestations provoked by the arsphenamines range all the way from a mild erythema or urticaria up to a severe scarlatiniform erythema and exfoliative dermatitis.

Stuhmer classifies arsphenamine dermatitis under three headings: (1) Acute vaso-toxic arsphenamine dermatitis; (2) subacute, anaphylactoid arsphenamine dermatitis; (3) chronic arsphenamine dermatitis, early and late.

The acute type appears within a short time after the injection and consists of acute urticarial and erythematous rashes as well as the "fixed" eruptions limited to certain parts of the body.

The subacute type appear from six to twelve days after the first injection, and although it becomes manifest at the time of the

second or third treatment, it bears no relation to these. The localization of the rash and the temperature curve resemble the reaction seen in serum sickness.

The early form of the chronic type usually manifests itself at the termination of a course of six to eight injections; the late form, from several to two or three months after the injections are completed. The severest types of dermatitis are seen, sometimes accompanied by fever and sometimes resulting in the death of the patient. Exfoliating dermatitis is the most frequent of the severe types seen.

Treatment of an Adult with Syphilis.—A conservative course of treatment for an average case of syphilis in an adult covers a period of forty weeks. This period of treatment comprises six doses of either arsphenamine or neoarsphenamine, given intravenously, at weekly intervals, followed by twelve intramuscular injections of mercury, one each week. A rest period of four weeks, with no medication, is then instituted. Following this period without injection, an additional eighteen weeks of weekly injections, six of the arsenic and twelve of the mercury, are administered. Subsequent treatment depends largely upon the Wassermann test or complications which may arise.

The first dose of arsphenamine administered is 0.45 gm. and subsequent doses: to the male, 0.6 gm.; to the female, 0.45 gm.

The first dose of neoarsphenamine is 0.6 gm. to the male and the remaining injections 0.9 gm.; to the female, 0.6 gm.

No set rule, however, can be given as the body weight has to be taken into consideration.

Mercury is given in the form of the salicylate and 1 gr. is administered intramuscularly on each injection.

Treatment of Infants.—Inunctions of the official mercury ointment, one-half strength, employing 1 dr. daily, give excellent results in congenital syphilis. The part chosen for inunction is the abdomen. The ointment is rubbed in for about twenty minutes each night after washing the part with soap and water and the excess allowed to stay on, the area being covered with a belly-band.

Neoarsphenamine has been very successfully employed, the dosage being in proportion to the weight of the infant. As a rule injections can be given into the veins of the scalp, a method much preferred to its administration into the sinus. As a rule infants tolerate the combined use of mercury and neoarsphenamine very well.

Local treatment of the lesions is required in comparatively few cases. The initial lesion is kept clean with soap and water, and a dusting powder, consisting of 10 gr. (0.65) of calomel; salicylic acid, 5 gr. (0.32); powdered talcum, 1 oz. may be employed (30.). An ointment containing 20 gr. of boric acid (1.3) to the ounce

(30.) of petrolatum may be used for gummatous lesions, or those which are sore and somewhat infected. In the resistant squamous syphilitic lesions of the palms an ointment composed of ammoniated mercury, 20 to 40 gr. (1.3 to 2.6); salicylic acid, 10 to 20 gr. (0.65 to 1.3); lanolin, 2 dr. (8.); petrolatum, 5 dr. (20.), is frequently indicated. Mucous patches should be touched with a 25 per cent solution of nitrate of silver or the acid nitrate of mercury. One of the most efficient mouth washes consists of a saturated solution of potassium chlorate, 20 gr. (1.3) to the ounce (30.) of water. The mouth should be kept scrupulously clean with a soft tooth-brush. The gums should be carefully and frequently inspected for signs of ptyalism.

YAWS (FRAMBESIA).

Definition.—A chronic infectious disease which is endemic in the tropics, characterized by a papular outbreak tending to form raspberry- or cauliflower-like patches.

Symptoms.—The affection has an incubation period lasting from two weeks to six months, during which there may be slight fever, headache, articular pains, and digestive disturbances. There may or may not be a primary lesion of a pinkish color, which is slightly raised and of a conical contour. The center necroses, becomes crusted, indurated, and papillomatous. The whole skin surface, or only a portion, is attacked by scaly, circinate patches, varying from one-third of an inch to two inches in diameter, covered with adherent brownish crusts, with at times a fetid discharge. There are also reddish or grayish vegetations which tend to heal in the center and are encircled by bullæ. The areas usually attacked are the skin about the orifices, the lips, the nostrils, the genital region, and the flexures. The mucous membranes and the viscera are unattacked, and there is no hair loss. There may be a general glandular enlargement, but not in all of the cases.

Etiology and Pathology.—The disease is limited to tropical countries. It is of common occurrence in the Orient, Oceania, Central Africa, and in Central and Southern America. It is seen almost exclusively in the black races, in both sexes, at all ages, but most often in children. The affection is inoculable and contagious, and apparently caused by a spirocheta (*Spirochæta pertenius*, discovered by Castellani). While the organism closely resembles the *Spirochæta pallida*, which causes syphilis, it is morphologically different. Although this organism has not been proved absolutely causal, and others have been found, it is probably etiological.

The disease has been inoculated into monkeys. According to Neisser's experiments, yaws or syphilis do not afford an immunity

against one another. A patient who has yaws may contract syphilis. The disease is usually contracted in infancy through some break in the cutaneous surface. Castellani believes that flies and other insects introduce the parasite.

Histologically the affection has the structure of a granuloma and resembles markedly lupus vulgaris, except for the absence of giant cells and the tubercle bacillus.

Diagnosis.—The disease is to be chiefly distinguished from syphilis, which it resembles markedly in certain instances, the Wassermann

Fig. 152.—Yaws. (Courtesy of Dr. E. B. Vedder.)

test being positive in each. The chief points of difference are the mucous membrane involvement in syphilis and its absence in yaws; the absence or slight glandular enlargement in the latter; the latter although frequent in children is not inherited; yaws itches and fungoid lesions develop on preëxisting patches. Yaws is a disease of the tropics.

Prognosis and Treatment.—The affection runs a course of from three to six weeks in limited cases; three to six months in children; and six to twelve months and longer in adults. European victims suffer with the disease usually for a longer period than natives.

Individuals in poor health may occasionally develop septic poisoning and death results. Mercury is of use, but not so effective as the iodides. Arsphenamine has proved curative.

D. DISEASES PROBABLY CAUSED BY VEGETABLE ORGANISMS.

ERYSIPELOID (ROSENBACH).

Synonym.—Erythema serpens (Morrant Baker).

Erysipeloid is the term applied to an affection which resembles erysipelas, but which is produced by infection from animal matter undergoing decomposition. This comparatively rare disease was first described clearly by Morrant Baker, and later was studied clinically and bacteriologically by Rosenbach.

Symptoms.—The outbreak starts at the site of a small trauma or break in the skin and consists of a dull red or purplish slightly elevated spot or zone which tends to spread, the older portions involuting.

The advancing border of the erythema is well defined and somewhat elevated, and there may be some swelling and puffiness. The disease advances slowly and is usually limited to a finger or a portion of the hand. The color changes to a yellowish as the patch subsides, and there is no desquamation. There may be itching and burning. The disease runs a course of from one to six weeks.

Etiology.—It is observed in those who handle putrid or spoiled meats and fish, such as butchers, fish dealers, poultry dealers, cooks, and those who handle animals products (anatomical workers, Jopson). Gilchrist in a study of 329 cases found that all but 6 were due to the bite of crabs.

Rosenbach described a cladothrix as the infective organism, but it has not been proved causative.

Treatment.—Treatment hastens the cure, although there is a tendency to spontaneous disappearance after some weeks. The parts should be kept either constantly moistened with a lotion containing ichthyol, 1½ dr. (6.); boric acid, 45 gr. (3.); powdered zinc oxide, 1½ dr. (6.); lime-water, 3 fl. oz. (90.); or an ointment composed of ichthyol, ½ to 1 dr. (2. to 4.); bismuth subcarbonate, 2 dr. (8.); petrolatum, 5 dr. (20.), applied three or four times daily.

POSTMORTEM PUSTULE.

Those who handle cadavers or perform postmortems, and also rarely butchers and those who are closely associated with dead

animals, may be attacked by a so-called postmortem pustule, as the result of inoculation with some unknown virus from the dead tissues. The inoculation occurs through some small break in the skin surface which is frequently so minute as to be unrecognized. An itching red spot appears at the point of inoculation, which develops into a vesico-pustule or pustule having a slightly or markedly inflammatory base. A superficial ulcer is observed beneath the crusted surface. The lesion is of a dull red color and may be accompanied with swelling of the surrounding parts; lymphatic involvement may give rise to red streaks, or exceptionally the affected area may have an erysipelas-like appearance. Constitutional symptoms may be absent, slight, or severe. The exact cause is unknown, but it is probably due to a vegetable organism (bacterial). Treatment consists of thorough opening of the lesion, cauterization of the base, and antiseptic dressing of bichloride of mercury, 1 to 1000. Constitutional treatment is rarely indicated.

E. DISEASES CAUSED BY VEGETABLE FUNGI.

FAVUS.

Synonyms.—Tinea favosa.

Definition.—A contagious, vegetable parasitic disease, usually attacking the scalp, occasionally the non-hairy surface, and characterized by small sulphur-yellow cups.

Symptoms.—The disease begins either as one or more scaly erythematous spots, as minute yellowish points, or as a group of small vesicles. The characteristic lesion of favus is a pin-head to pea-sized, friable sulphur-yellow cup which is pierced by a hair. The convex portion of this cup-like (scutulum) lesion is pressed down upon the papillary layer of the corium, and the concave portion projects slightly above the skin surface. Beneath the scutulum there is found a reddened excavation, and the surface is atrophied if the lesion is of long standing. The lesions tend to become confluent and irregular, thick, yellowish, mortar-like masses are formed. The affected areas may become brownish in color from the admixture of extraneous matter. The scalp hairs become brittle, lusterless, break off, split, and may fall out. The entire scalp may eventually be attacked, the portion first involved showing atrophy, permanent hair loss, either complete or partial, and only a few areas of active disease. If a large number of lesions are present an odor is exhaled resembling stale, musty straw, mice, or the urine of cats. There may be a secondary pus infection. The disease runs a slow course.

Favus of the general surface or non-hairy parts is of rather

unusual occurrence and, if present, in the great majority of instances is associated with the disease of the scalp. It may begin around the lanugo hair follicles, or as a circinate patch, with the circumference somewhat inflammatory, sometimes papulo-vesicular, and studded with small yellow points and favus scutula. As the central portion of the circinate lesion tends to clear up, excepting for the sulphur-yellow cups, it resembles ringworm. Rarely the patch may consist of several concentric rings. There is a tendency, however, in most instances, for the lesions to become confluent and to form irregular, rough, yellowish masses, at times consider-

Fig. 153.—Favus (tinea favosa).

ably raised above the surface. If the malady is neglected large areas develop, involving a considerable portion of the cutaneous surface, particularly the extremities. The spread of the disease is more rapid in those in poor health. Marked atrophy of the underlying skin is apt to result and occasionally distinct ulceration. When the nails are attacked, which is rare, light or deep yellowish circumscribed spots become visible through the nail structure, and they become thickened, irregularly split, laminated, separated from the matrix, or atrophied. It is usually secondary to favus of the scalp, and infection supposedly occurs from scratching the scalp. (See Onychomycosis.)

In rare instances the mucous membranes may be attacked, particularly the glans penis. Kaposi reported a fatal case in which the favus fungus was found in the esophagus, stomach, and intestines. Itching may be present in a mild or severe degree.

Etiology.—Favus is a contagious disease, though not so frequently communicated as is ringworm. Not infrequently but one case is observed in a family. It may be conveyed from one individual to another, or from the lower animals, such as cats, dogs, rabbits, fowl, mice, and, exceptionally, cattle and horses to the human species. It is commonly found in northern Italy, southern France, Russia, Poland, Austria, Germany, Hungary, and in Scotland, but it is rare in England and in our own country, excepting in immigrants. Favus of the skin surface is very rare in native-born Americans.

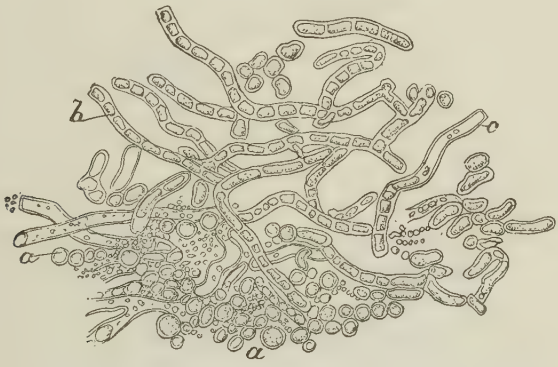


FIG. 154.—Achorion Schönleinii: *a*, spores; *b*, *c*, sporophores. (After Cornil and Ranvier.)

Pathology.—The cause of the affection is the *Achorion Schönleinii*, discovered by Schönlein in 1839. The fungus is profusely present and consists of mycelium and spores. The spores are round, oval, or somewhat elongated, and vary from 0.0023 to 0.0052 mm. in diameter. The mycelium is composed of narrow, apparently flattened tubes or threads, which ramify in all directions without definite arrangements. They average from 0.0023 to 0.003 mm. in diameter and vary considerably in length, are straight, curved, bent, or crooked, and branch in a forked manner, resembling at times the links of a chain. As the entire favus cup is composed of fungus the organism can be easily demonstrated. Place a small portion of the yellowish material in a drop or two of liquor potassæ, cover with a cover-slip, allow it to stand for a few minutes, and then examine under the high-power lens, not the oil immersion, of the microscope. Although the *Achorion Schönleinii* causes favus in

the great majority of instances, there are four other species of the achorion which produce favus in animals, and very exceptionally in human beings. These species are: Achorion gallinæ; Ospora canina of Sabrazes-Constantin; Achorion quickeanum of the mouse; Achorion gypseum of Bodin.

Diagnosis.—The sulphur-colored cup, with the subsequent atrophy of the hair follicles, scar-like appearance of the scalp surface, partial or complete permanent hair loss, and the easily found fungus offer a very clear picture.

Prognosis and Treatment.—The disease of the scalp is extremely difficult to cure, the roentgen-rays offering the quickest and best means of eradication. The technic for this method of treatment is given under the section on roentgen-ray therapy. Favus of the nails also should be treated by roentgen-ray exposures. The disease of the non-hairy parts is more responsive to local applications.

The treatment of favus of the scalp is the same as described under ringworm of the scalp. The remedies recommended for ringworm of the skin surfaces are applicable to favus of the non-hairy parts. The therapeutic measures for favus of the nails are detailed under onychomycosis.

RINGWORM.

It was originally considered that all types of ringworm and in all situations were caused by the one fungus, the trichophyton. Thanks to the elaborate investigations of Sabouraud, over forty different varieties of fungi have been isolated, eleven of which occur fairly frequently. The causative fungi of ringworm are divided into two main groups: the small spore fungus, or the *microsporon,* and the large-spore fungus, the *megalosporon,* or *trichophyton*. The trichophyton or megalosporon fungus is further divided according to its relationship to the hair shaft into "endothrix," in which the fungus is found within the hair shaft, and the "ectothrix," in which it is located outside of and chiefly on the surface of the hair shaft. The latter two types may be combined, fungi being found both in the cortical portion of the hair and on the surface of the hair shaft. The megalosporon endothrix (*trichophyton endothrix*) may be unaffected by a solution of potassium hydrate, the *resistant* variety, or disintegrated by this preparation, the *fragile* variety.

The following table shows some of the more important varieties of the microsporon and trichophyton groups:

- Microsporon
  - Audouini.
  - Lanosum.
  - Equinum.
- Trichophyton
  - T. endothrix
    - T. acuminatum.
    - T. crateriforme.
    - T. violaceum.
  - T. ectothrix
    - Small-spored
      - T. asteroides.
      - T. equinum.
    - Large-spored
      - T. ochraceum.
      - T. rosaceum.
  - T. ectoendothrix — T. cerebriforme.
  - T. neoendothrix — T. plicatile.

Microsporon Audouini.—The spores are usually rounded, occasionally somewhat oval, often double contoured, contain granules and liquid, and are from 2 to 2.5 mm. in diameter. The mycelium consists of sharply contoured, transparent, pale gray branching threads or tubes, showing frequently slight bulging at irregular intervals, and often terminate in mycelial spores. The spores are very abundant and frequently give a resemblance to a mosaic pavement. There may be but a few mycelial threads demonstrated. Cultures are of a grayish color, with three or four lines of depression radiating from the center to the periphery.

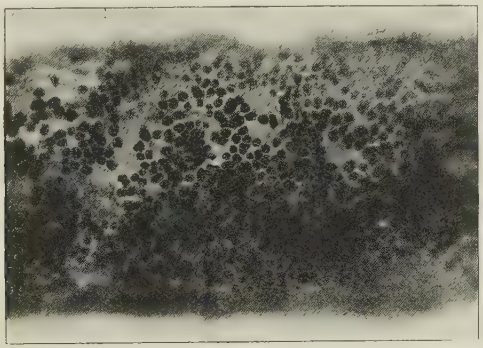


FIG. 155.—Portion of a hair showing the Microsporon Audouini. From a photomicrograph. (Ormsby.)

Microsporon Lanosum.—This type of fungus is derived from the dog and may give rise to a ringworm of the scalp and of the smooth surfaces. Cultures are more rapid in growth than M. Audouini and exhibit a central smooth area surrounded by a characteristic elevated white woolly ring.

Microsporon Equinum.—This variety, derived from the horse, has attacked, in rare instances, non-hairy parts.

Trichophyton.—The spores and mycelium are larger than those of the microsporon. The spores are from 3 to 6 microns in diameter and are arranged in a ladder-like or bead-like manner, forming band-like mycelium. The mycelium does not branch so much as that of the small-spored fungus. The mycelium of the ectothrix variety is larger, more abundant, and the septa are longer than in either the *endothrix* or the *microsporon*.

Trichophyton Acuminatum.—This type of fungus may attack the scalp or the smooth surfaces. It may be found in certain instances in the dry form of "eczematoid ringworm." The mycelia or long chains of round spores, resembling a string of beads, are found within the hair.

FIG. 156.—Culture of a microsporon, the microsporon lanosum, obtained from a case of ringworm of the scalp. (Courtesy of Dr. Frederick Weidman.)

Trichophyton Crateriforme.—The fungus is found in the hair as long ribbons or chains made up of square elements, within and parallel with the long axis of the hair. In the epidermic scales the fungus exists as mycelial filaments composed of numerous short rectangular joints or spores. There is comparatively little inflammation produced by this variety of fungus.

Trichophyton Violaceum.—Lesions may be produced upon the smooth skin, in the beard and the scalp, of an inflammatory character. It has been found in "eczematoid ringworm." The nails may also be invaded. The fungus shows mycelia with few divisions in the epidermis. The spores occur in the hair without a definite chain or ribbon arrangement; when fully developed it is a pure endothrix.

Trichophyton Asteroides.—This fungus is of animal origin and gives rise to inflammatory and suppurative forms of ringworm of the scalp (kerion) and the smooth surface. The spores are small,

3 to 4 microns in diameter, and are located outside of the hair. The cultures of this variety are of rapid growth, with a central eminence which later becomes umbilicated, surrounded by a star-like border, and the surface is covered with a white powder.

Trichophyton Equinum.—This fungus is of animal variety, exhibiting large spores and of the ectothrix type. It may produce ringworm of the smooth skin or a suppurative outbreak in the beard.

Trichophyton Ochraceum.—The fungus is of the same type as found in T. equinum. It gives rise to favus-like cultures. It may produce pustular lesions. Those handling cattle are more apt to show the outbreak.

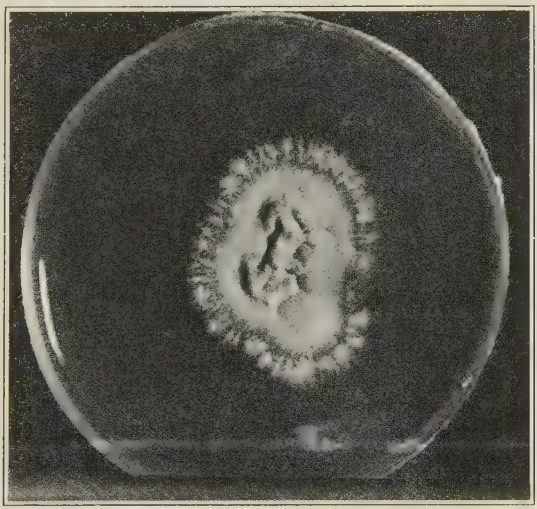


FIG. 157.—Epidermophyton inguinale fungus (grown on proof agar.) (Courtesy of Dr. Frederick Weidman).

Trichophyton Rosaceum. This variety of fungus is of animal origin and produces rose-colored cultures. The spores are found outside of the hair shaft and are from 8 to 9 microns in diameter. It may produce lesions in the beard resembling keratosis pilaris.

Trichophyton Cerebriforme.—The fungus is found both within and outside of the hair shaft. It rather usually attacks the scalp, the smooth surfaces, and more frequently the beard. Cultures made upon proof media are characterized by a wrinkled surface, which tendency increases with growth.

Trichophyton Plicatile.—The fungus is observed both within and outside of the hair shaft. It is rarely found. This type may be found in ringworm with nodules, ulcers and infiltrated plaques, on the scalp, bearded region or glabrous skin.

Epidermophyton Inguinale. The parasite present in ringworm of the thighs and axillæ, the so-called eczema marginatum, and in certain inflammatory ringworms of the hands and feet, although morphologically and culturally closely akin to the trichophytons, presents some characteristic features which separate it from these fungi. It is confined to the epidermis, where it occurs as mycelial threads with rectangular double-contoured joints having a transverse diameter of 4 to 5 microns and somewhat variable length. Even in hairy regions, such as the pubes and axillæ, the hairs remain free, a fact noted by Hebra. Cultures are of slow growth, have a downy surface, with a slightly eccentric hood-like elevation, are divided by a number of radiating furrows, and are of a characteristic greenish-yellow color.

FIG. 158.—Filaments and spores of the trichophyton from the beard of a patient affected with tinea sycosis. (Ormsby.)

Fungi can be readily demonstrated by placing some of the scales from a patch of ringworm or an affected hair in a few drops of a 10 per cent solution of liquor potassæ on a glass slide, covering with a cover-slip, and after allowing to dissolve for a few minutes, examine under a high-power lens, not an oil immersion, of a microscope. Although elaborate cultural experiments have been successfully made by Sabouraud, the demonstration of the fungus by the easy method just detailed will be sufficient for our purposes.

Sabouraud uses two special media for culturing the fungi, maltose and glucose-proof media, the formulæ for which are water, 1000 gm., crude maltose (Chaunt), 40 gm.; granulated peptone (Chassering),

10 gm.; gelose, 18 gm. (maltose-proof media); in the glucose-proof medium the same quantity of the glucose is used in place of the maltose. For a further description of the different varieties of fungi the reader is referred to *Diseases of the Hair*, Jackson and McMurtry, and Sabouraud, *Les Teignes*.

Ringworm is divided into *ringworm of the general surface*, or *tinea circinata*; *ringworm of the scalp*, or *tinea tonsurans*; *ringworm of the bearded region*, or *tinea sycosis*.

FIG. 99.—Portion of a hair invaded by the Trichophyton endectothrix. × 500. (Ormsby.) *a*, *a*, chains of spores in focus; *b*, a chain situated farther within the hair, and thence not in focus. (From a photomicrograph.)

Ringworm of the General Surface.—**Synonyms.**—Tinea circinata; Tinea trichophytina corporis.

Symptoms.—The disease starts as one or more small, slightly elevated, sharply limited, somewhat scaly, pinkish-red spots which spread peripherally and tend to clear up more or less completely in the center. The typical patch is ring-shaped, from $\frac{1}{2}$ to 1 inch in diameter, the center either whitish or pale pink in color, slightly scaly, and the borders somewhat elevated, hyperemic, mildly inflammatory, and pinkish-red in hue. The patches after reaching a certain size may remain stationary or tend to spontaneous disappearance. As involution occurs, the patches become less inflammatory and of a pale, brownish-red color. Some of the patches remain small and insignificant and without central clearing. Con-

fluence of the patches at times occurs and large, irregular, gyrated areas are formed. Exceptionally ringworm may consist of two or three concentric rings. Some of the patches may be quite inflam-

FIG. 160.—Typical ringworm (Tinea circinata.)

matory, the periphery is markedly elevated, red, and not infrequently consists of closely arranged papules, vesico-papules, and exceptionally vesicles or pustules.

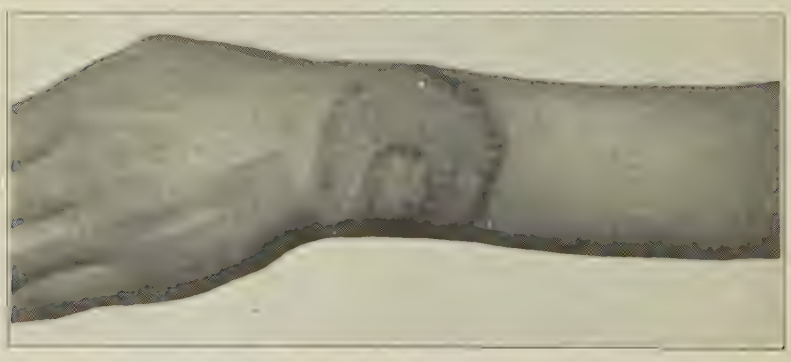


FIG. 161.—Ringworm with two rings.

There are frequently only one or two patches present, at times five, ten, or more. The areas most frequently attacked are the face, the neck, the hands, the forearms, although any portion of the cutaneous surface may be involved. In rare instances a patch in the neighborhood of the lips or vulva may extend on to the mucous membrane.

Deep-seated Ringworm.—One of the rarer varieties of ringworm is characterized by an elevated inflammatory patch covered with crowded follicular papules or papulo-pustules, of an irregularly rounded or oval contour, considerably infiltrated and deep down in the skin. In others the inflammatory symptoms may be quite marked, there is considerable elevation, the lesion is boggy, resembling somewhat a carbuncle, and there is a follicular, seropurulent, or mucopurulent discharge (*perifolliculitis suppurativa conglomerata* of Leloir). This deep-seated type of ringworm, in rare instances, flattens centrally and extends peripherally with follicular papulo-

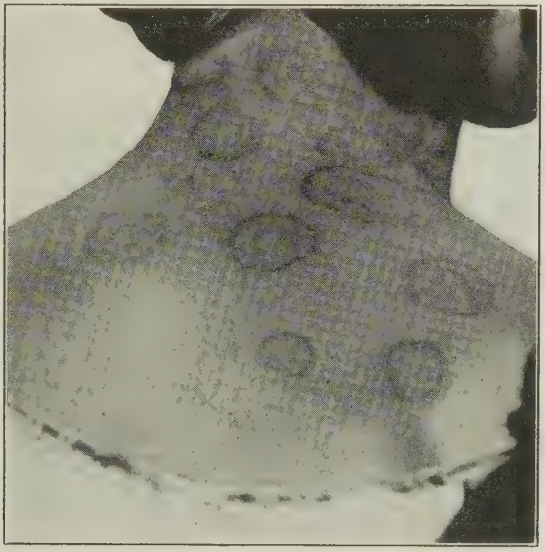


Fig. 162.—Multiple patches of ringworm, some with concentric rings.

pustules, pustules, or inflammatory infiltrations (*agminate folliculitis* of Duhring and Hartzell). Granulomatous tumor-like lesions with ulcerative tendency caused by the trichophyton fungus are occasionally observed (*granuloma trichophyticum* of Majocchi).

Eczematoid Ringworm of the Hands and Feet.—Ormsby gives an admirable résumé of eczematoid ringworm of the extremities and his description will be freely quoted.[1] This condition was first described, in 1892, by Djelaleddin Mouktar, in 1908 by Whitfield, and in 1910, Sabouraud demonstrated the organism to be identical with that which produces eczema marginatum. The lesions in this variety occur, as a rule on the feet, occasionally on the hands. The

[1] Ormsby: Diseases of the Skin, 1921, 2d ed., p. 869.

symptoms, as outlined by Whitfield are as follows: The clinical types are divided into three groups: (1) The acute vesico-pustular; (2) the chronic intertriginous, attacking the toes; and (3) the hyperkeratotic of the palms and soles. The first variety is acute. The disorder comes on suddenly, in from twenty-four to forty-eight hours, and has all the characteristics of acute vesicular eczema or dysidrosis. In the second type (secondary to a more or less acute attack) there occurs a white, sodden mass of epithelium between the toes, with a more or less well-defined margin and slight vesiculation at the dorsal edge of the entire phalangeal skin. On the plantar surface the eruption spreads downward beyond the roots of the toes, to terminate in a well-defined but somewhat irregular line about opposite the head of the metatarsals. At this free edge

FIG. 163.—Eczematoid ringworm.

the horny layer is in a constant state of desquamation, and the free edge of the scale is, as is always the case in ringworm, definitely turned toward the center of the eruption. The hands may be similarly affected. Intense itching is present, and occasionally soreness, from the patient rubbing the area. The third, or hyperkeratotic type, attacks the whole of the soles and occasionally the palms. The salient feature is the enormous and irregular massing of the overgrown horny layer. There are here and there small, indolent pustules, some of which only show staphylococci, while others bear the fungus in the roof. The dry type on the palms and soles is usually caused, according to Sabouraud, by Trichophyton violaceum and Trichophyton acuminatum. The duration of the disorder is variable, but in most of the intertriginous and hyper-

keratotic cases seen by Whitfield the disease had been present for a number of years, the longest period being over twenty years. Sabouraud believes the disease to be common, and states that in the major portion of the so-called cases of intertrigo of the toes the disease is caused by Epidermophyton inguinale.

In a clinical study of 65 patients, in all of which the diagnosis was confirmed by the microscopical findings, Ormsby and Mitchell corroborated the above findings.

Tinea Cruris (*Eczema marginatum*).—This variety of ringworm usually attacks the genito-crural region, and occasionally, in addition or alone, one or both axillæ. It may begin as an ordinary superficial ringworm type, usually several or more areas being present, or quite frequently it starts as an intertrigo or eczematous area. The patches

FIG. 164.—Tinea cruris.

may remain limited, mildly or moderately inflammatory, or because of the heat and moisture of the affected parts, spread rather rapidly, fairly large areas being covered by the growth of the single patch or the confluence of several lesions. The whole of the genito-crural region may be attacked; in extreme instances the patch may extend down the thigh, upward on the pubic region, and posterior to the anus and surrounding parts. Exceptionally, in women, the ringworm may extend to the vulva. Although it may resemble an eczema markedly, its sharp margination and the presence of fungus distinguish it.

Dhobie itch is the name given to inflammatory tinea cruris in certain tropical countries, where it usually involves both the genito-crural and axillary regions. The intense heat of the tropics

sodii hyposulphitis ʒ ss
aquæ ℥j
or ac. acetici glacialis gtt xxx
aquæ ℥j

causes the active proliferation of the organism, sweating, moisture, heat, and friction of the affected parts to such a degree that the patient may be confined to the house. The itching may be intense and the parts become raw from excoriation. Secondary pustular infection, such as boils and abscesses, may develop. The disease is supposed to be due to laundering infected clothing; hence the term "dhobie (laundrymen's) itch."

Ringworm of the general surface may be accompanied by slight itching, except in those of an inflammatory type, eczematous aspect, the so-called eczema marginatum (tinea cruris), and dhobie itch, in which it is frequently severe.

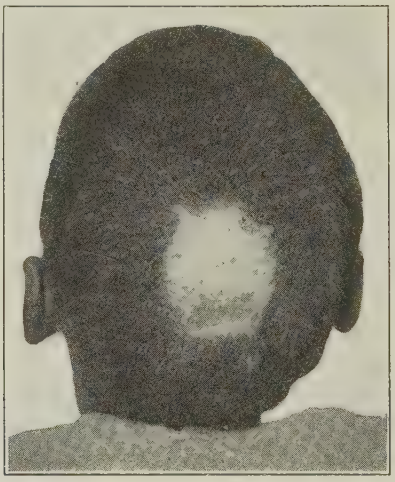


FIG. 165.—Ringworm of the scalp. (Tinea tonsurans.)

Ringworm of the Scalp.—**Synonym.**—Tinea tonsurans.

Symptoms.—The affection begins as a scaly spot, with no tendency to central clearing. The typical ringworm, as commonly seen, consists of a rounded area, with prominent follicles, giving a goose-flesh appearance, broken-off hairs, a partial hair loss, a whitened scaly surface, and the hairs in the affected spot pull out easily without traction. The patch varies from a fraction of an inch to several inches in diameter. There are frequently several patches present, which may coalesce, and in this way a considerable portion of the scalp is involved. The condition may take some weeks or months to reach its full development, running either a progressive course or, after reaching a certain size, remain stationary. Alder Smith described "disseminated ringworm," in which there were

numerous small scattered spots, in each of which only a few follicles were involved.

Exceptionally the hairs are broken off just at the follicle mouth, and the patch has a dotted appearance, the so-called *black-dot*

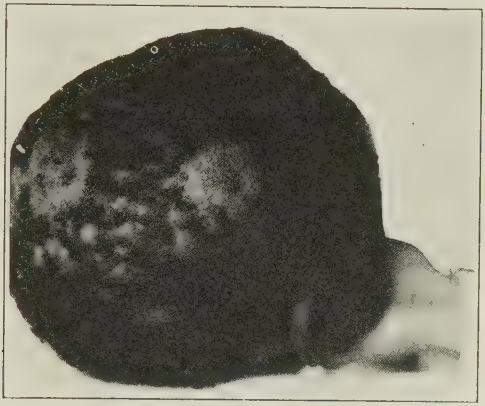


FIG. 166.—Ringworm of the scalp, usual type.

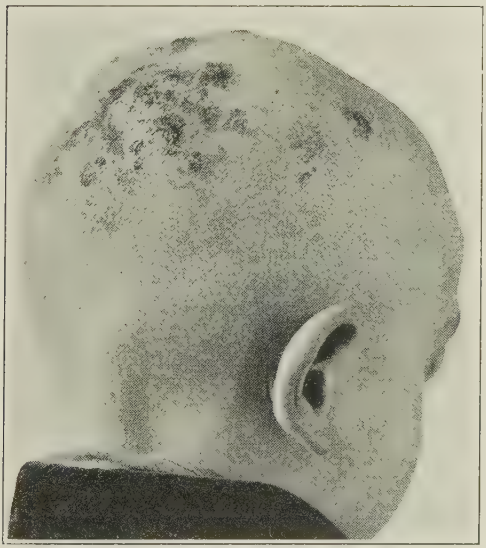


FIG. 167.—Tinea kerion (inflammatory type of ringworm of scalp). (Courtesy of Drs. Fordyce and MacKee.)

ringworm. Rarely some of the areas may be entirely denuded of hair, the affection developing and extending rapidly, and is then known as the *bald ringworm* of Liveing.

Inflammatory Ringworm (Tinea kerion).—Exceptionally the ringworm is markedly inflammatory and is characterized by its deep-seated edematous, boggy, elevated, carbuncle-like character. It is sometimes painful, and there is a mucoid or mucopurulent discharge from the follicular openings. Very exceptionally the entire growth breaks down and empties like an abscess (*granuloma trichophyticum* of Majocchi). The intensity of the inflammatory action in tinea kerion may result in destruction of the fungus, and a spontaneous cure results.

FIG. 168.—Tinea sycosis, superficial type.

Ringworm of the Bearded Region.—**Synonyms.**—Tinea sycosis; Tinea trichophytina barbæ; Parasitic sycosis; Barber's itch.

Symptoms.—There are two distinct types of ringworm of the beard: One which remains superficial and the other deep-seated or nodular. The disease usually begins as one or more rounded, slightly scaly, hyperemic patches, with, in some, a slight tendency to central clearing.

Superficial Type.—The areas enlarge, the central portion clears up, and the spreading border is distinctly elevated. The patch in fact resembles markedly that found in ringworm of the general surface. The hair follicles later become involved either to a slight or marked extent and the condition may resemble a patch of scalp ringworm. The patches after reaching a certain size may remain stationary or even retrogress. There may be but the one or several

areas present, and by confluence a considerable portion of the bearded region shows involvement. There is often slight itching. In most instances the affection runs into the deep-seated type of the disease.

Deep-seated Type.—This variety either starts as superficial patches or with immediate involvement of the follicles. There is infection with the fungus deep in the follicles, and as a result there is subcutaneous swelling and the formation of lumpy and nodular masses. These masses consist of crowded, sluggish, flattened furuncle-like or abscess-like lesions, having a carbuncular aspect.

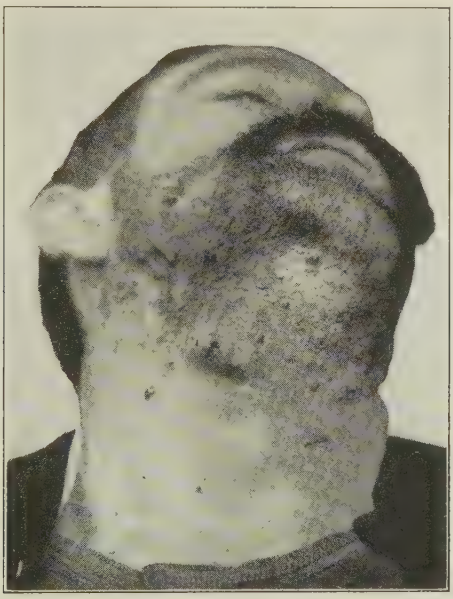


FIG. 169.—Tinea sycosis, moderate severity.

The overlying skin is usually considerably reddened, glossy in appearance, and studded with a few or numerous follicular pustules. The nodules tend to soften and break down, discharging through several openings a thick, mucoid purulent or purulent material, which may dry with the formation of thick, adherent crusts. The hairs fall out of the boggy, tumor-like masses, but may show the typical broken-off appearance around the circumference. There is at times only the one carbuncular-like formation, or the bearded region is extensively attacked. The mustache area is usually unattacked, and, if involved, in combination with the disease of the bearded region. The affection does not tend to spontaneous

disappearance. There is slight itching in the beginning and subsequently soreness and tenderness.

Ringworm of the nails is considered under Onychomycocis.

Etiology of Ringworm. — Ringworm is caused by inoculation with either a small- or a large-spored fungus. The disease is contagious. It is conveyed by direct contact or through the medium of toilet articles and wearing apparel. It is frequently found in children's schools, institutions, and day nurseries. Barber-shops, hair-dressing establishments and laundries are prolific sources of communication. It is frequently transmitted from the lower animals, such as the cat, dog, horses, cows, rabbits, and other animals.

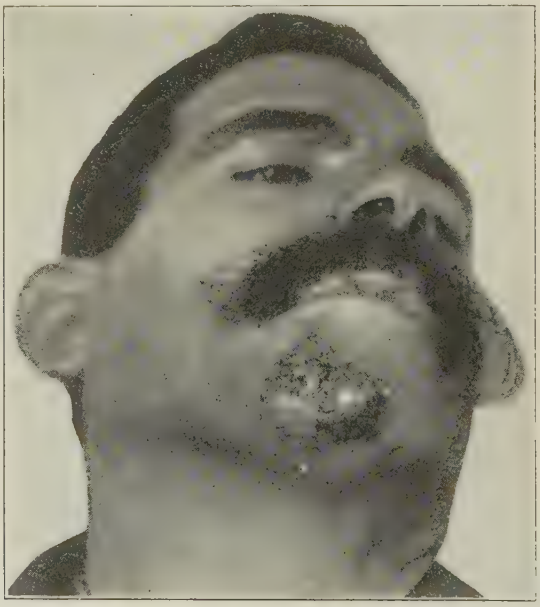


FIG. 170.—Tinea sycosis, deep-seated type.

Ringworm of the general surface may occur at any age in either sex, but it is more frequently observed in children or in young adults. It is usually caused by the *large-spored fungus*, commonly the *ectothrix* variety.

Tinea cruris is most often found in the young or middle-aged adult, as is also the *eczematoid ringworm* on the hands and feet. It is caused by the *epidermophyton inguinale*, indistinguishable except culturally from the *trichophyton*.

Ringworm of the scalp is limited to children. In but very rare instances has the affection occurred later than sixteen years of age.

It is produced in from 88 to 90 per cent of the cases seen in this country by the *small-spored fungus*, usually the *microsporon Audouini;* in the remaining 10 per cent by the *endothrix* variety of the *trichophyton*, the *large-spored fungus*. The inflammatory type, *tinea kerion*, of the scalp is caused usually by the *ectothrix, large-spored fungus.*

Ringworm of the beard is found in the adult male and is caused by the *large-spored fungus* of either the *endothrix* or *ectothrix* varieties.

Dhobie itch is probably caused by the *epidermophyton inguinale*, microscopically practically the same but culturally different from the trichophyton fungus; but the *microsporon furfur* (found in tinea versicolor) and the *microsporon minutissimum* (found in erythrasma) have also been present in some instances.

Pathology.— The fungus invades the epidermis, the upper or lower portion of the hair follicle, and the hair, the perifollicular tissue, and the derma proper. The *ectothrix* is believed to be exclusively of animal origin, particularly from the horse or cat. The *small-spored fungus* is believed to be occasionally derived from the horse, the cat, or dog.

Investigations tend to prove that the *deep-seated ringworm* affects immunity against further attacks (Jadassohn). The superficial varieties exert no such protection.

Diagnosis. *Ringworm of the non-hairy surface* of the typical annular formation should offer very little difficulty in differential diagnosis. The *circinate nodular syphiloderm* is chiefly distinguished by its greater infiltration, its slow course, long duration, color, often pigmentation, kidney-shaped ulceration, scarring, and frequently other signs of the disease. *Seborrheic dermatitis* is of a greater distribution, the scalp, the alæ of the nose, the eyebrows, the eyelids, the sternum, between the shoulders, the armpits, the pubic region, and occasionally the bends of the elbows and popliteal spaces are involved. The patches in seborrheic dermatitis are not clear in the center, but covered by a greasy yellow scale. *Psoriasis* occurs in ringed patches, particularly during involution, is extensive in distribution, there are many patches, and the scalp and extensor surfaces are usually extensively involved.

Tinea cruris is distinguished from eczema and seborrheic dermatitis. *Eczema* fades off into the sound skin, the patch is more or less uniform in consistency and appearance, and has not a predilection for the areas attacked by tinea cruris. Tinea cruris is sharply marginated with a raised border and central clearing; it is limited to the genito-crural region, the axillæ, or both, and the fungus is readily demonstrated.

Eczematoid ringworm on the hands and feet usually has to be diagnosed by the finding of the fungus.

The *deep-seated ringworm* is diagnosed from *carbuncle* by the absence of constitutional symptoms, the marked inflammatory follicular yet circumscribed character, and the demonstration of fungus.

Ringworm of the scalp of the usual type has to be differentiated particularly from alopecia areata:

Alopecia Areata.	Ringworm of Scalp.
More apt to develop after puberty.	Occurs under sixteen years of age.
Attacked areas entirely bald.	Attacked areas only partially bald.
Hair follicles less prominent than normally or indiscernible.	Hair follicles unusually prominent ("goose-flesh") appearance.
No broken-off hairs.	Broken-off hairs in or on border of patch.
Hairs on border of patch firmly attached.	Hairs in patch pull out easily.
No scale on the attacked area.	Area of attack usually scaly.
Microscopical examinations show no fungus.	Microscopical examination shows fungus.

Seborrhea shows a greasy yellowish-white scale over the entire scalp, and there is no patchy hair loss or prominent follicles. The scale of *psoriasis* is more abundant, patches are elsewhere on the body and covered by thick silvery-white scales. *Eczema* is diffuse, not of an annular formation, itches intensely, and frequently is oozing. *Favus* is differentiated by the sulphur-yellow cups, its chronic course, the atrophy of the skin and follicles, and permanent hair loss.

Inflammatory ringworm of the scalp is distinguished from *carbuncle* by its sharp margination, the lack of constitutional symptoms, its follicular character, and the presence of fungus. An abscess is likewise excluded. *Ringworm of the beard* of a superficial type is diagnosed from other affections, particularly the *circinate nodular syphiloderm*, by its superficial character, acute course, the lack of atrophy, pigmentation, ulceration, scarring, and the presence of fungus.

Deep-seated beard ringworm is excluded from a *carbuncle* or *abscess* by the lack of constitutional involvement, pain, widespread infiltration, and surrounding inflammation, follicular character, and the presence of fungus. *Sycosis vulgaris* is characterized by discrete pustules, each of which is pierced by a hair, by its tendency to attack the upper lip, either alone or in addition to the bearded region, the lack of hair loss, the absence of tumor-like masses, and fungus is not present.

Prognosis.—Ringworm of the body surface, with the exception of the eczematoid variety on the hands and feet, are readily cured in a few days or one or two weeks. The latter may require a longer

period. Ringworm of the bearded region, of the deep-seated variety, may take some weeks to eradicate and the hair frequently returns slowly. Ringworm of the scalp of the common variety is extremely refractory to treatment and many months of persistent care are required. The roentgen-ray hastens the cure in the latter cases by several months. The inflammatory ringworm of the scalp is somewhat self-curative and a favorable termination is much more rapid than in the other scalp ringworm cases.

Treatment.—It is a well-known fact that *ringworm of the scalp* is one of the most refractory conditions that the dermatologist

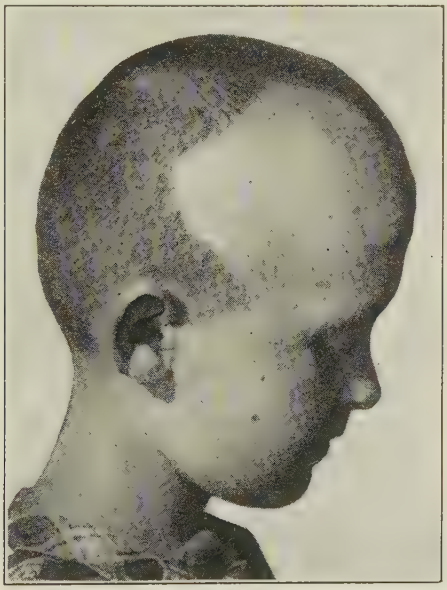


FIG. 171.—Depilation produced by roentgen-ray treatment in the cure of ringworm of the scalp.

or practitioner is asked to cure. The average time formerly required for the elimination of the ringworm fungus from the scalp was nine months. Since the newest method of treatment, the roentgen-ray, has been instituted a cure can be effected in the large majority of cases in approximately three months.

In the treatment of ringworm of the scalp with the roentgen-ray, one skin unit is given to the affected area. If several patches are present it may be necessary to expose the entire scalp to this therapeutic measure. The technic employed is described under the section on roentgen-ray treatment. Before carrying out this method the hair should be clipped short. Ten days, approximately

after the depilating dose has been given, the hair starts to fall and complete hair-fall is accomplished, in the treated area in about three weeks. One to two months later a fuzz is observed and in approximately three to four months the hair is entirely restored and the disease has been cured. A 4 per cent ammoniated mercury ointment may be used on the scalp, twice daily, following the roentgen-ray exposure until the hair has entirely fallen out of the area exposed to the roentgen-rays.

It may not be feasible to treat ringworm of the scalp with the roentgen-rays, and therefore the older and slower methods must be resorted to. In all cases of ringworm of the scalp it is a wise precaution to shave all of the hair from the scalp, or at least to remove the hair from the patch or patches and immediately surrounding areas. The child should wear constantly a tight-fitting cap made of muslin or some other easily boiled material. The scalp should be washed once or twice daily with warm water and a mild soap, such as Castile, and should be shaved every week or ten days. As the hair grows into the infected areas after shaving, all the loose ones should be depilated, a dozen or more daily, with forceps, the latter being carefully sterilized after each depilation. The patient should use individual towels, comb, brush, and soap, and under no circumstances let any article belonging to another child touch the affected area.

As the hair on the general scalp is now kept closely shaved and scrupulously clean, and the loose hairs in the ringworm patch have been removed, we will consider the therapeutic preparations which have been commonly used, and those which have proved the most beneficial. A thin base should always be used on the hairy part, even if the hairs are kept closely shaved. The bases usually prescribed consist of benzoinated lard, cold cream, petrolatum, lanolin, and, because of its highly penetrating power, goose grease.

Numerous ingredients have been mentioned for application in the various bases suggested, and the following remedies have all proved valuable in this stubborn affection: Precipitated sulphur, the various tar compounds, such as the oil of cade, the official tar ointment (ung. picis. liq.), liquor carbonis detergens (a mixture of tincture of soap bark and coal tar); ammoniated mercury, calomel, bichloride of mercury, picric acid (1 per cent solution in water), the tincture of iodine, the crystals of iodine, salicylic acid, and chrysarobin.

These preparations should be thoroughly rubbed in with the fingers protected by cotton or rubber gloves, or with a brush.

Applications should be made at least twice daily and each patch should be manipulated for five minutes.

Precipitated sulphur is used in the strength of from 30 gr. to $1\frac{1}{2}$ (2. to 6.) dr. to the ounce (30.). Oil of cade should be made up in olive oil 1 dr. (4.) to the ounce (30.), and in certain cases even the full strength of the official preparation can be used without causing irritation. Official tar ointment is used at first in the strength of 1 dr. (4.) to the ounce (30.) of one of the thin ointment bases, and increased, as the patient's scalp can stand it, up to its undiluted formula.

Liquor carbonis detergens is applied in the strength of 1 dr. (4.) to the fluidounce (30.) or water, or may be made up in one of the ointment bases. The latter preparation may also be increased in strength, and if it produces no irritation the undiluted compound may be employed. Ammoniated mercury or calomel should be used in an ointment, and is usually prescribed $\frac{1}{2}$ dr. to 1 dr. (2. to 4.) to the ounce (30.). The bichloride of mercury, made up in water, is prescribed in the strength of $\frac{1}{4}$ to $\frac{1}{2}$ gr. (0.016 to 0.03) to the fluidounce (30.). The tincture of iodine is applied in its full official strength, diluted with water or alcohol or combined with the biniodide of mercury, 1 to 3 gr. (0.06 to 0.18) to the fluidounce (30.).

Salicylic acid is used to increase the strength and stimulating or germicidal power of various other preparations rather than alone. The acid is applied in a somewhat sliding scale, according to the irritability or resistance of the scalp, approximately from 10 gr. (0.65) to a dram (4.) to the ounce (30.), the former strength being more frequently used. As salicylic acid is quite insoluble, particularly in water, it should be employed in alcohol or an ointment base. The salicylate of sodium in a watery solution is preferable because of its solubility, but it is only about half as strong and not so effective as salicylic acid.

The two preparations which are probably the most efficacious in scalp ringworm, but which must be used with care, are iodine crystals, 1 dr. (4.), made up in 1 oz. (30.) of goose grease; the other is chrysarobin, 10 to 30 gr. (0.65 to 2.); salicylic acid, 20 to 40 gr. (1.3 to 2.6) to the ounce (30.) of lanolin. The iodine preparation is applied twice daily with a stiff brush. The chrysarobin prescription must be applied cautiously to prevent any irritation of the surrounding parts, particularly guarding against its getting into the eyes. It should be thoroughly rubbed into the patch for at least five minutes, night and morning, the manipulator wearing a thick rubber glove. The writer has had the best results with the latter preparation and the next best with the iodine crystals. Roentgen therapy is the method of choice.

Cases of *inflammatory ringworm* of the scalp should be treated with much milder remedies than the indolent non-inflammatory type. In this kerion-abscess-like outbreak lotions act exceedingly

well, particularly ichthyol lotion, ½ to 2 dr. (2. to 8.) to the fluidounce (30.) of water; or the hyposulphite of soda, ½ to 1 dr. (2. to 4.) to the fluidounce (30.) of water or witch-hazel. The ointments which prove most efficacious are precipitated sulphur, ½ dr. (2.) to the ounce (30.) of petrolatum; and if much crusting is present, ammoniated mercury, 20 gr. (1.3) to ½ oz. (15.) each of lanolin and petrolatum.

Tinea sycosis or *ringworm of the bearded region* is usually of a very inflammatory type, and fairly mild applications are used. Dressings kept continuously wet with a saturated solution of boric acid, or the hyposulphite of sodium, ½ to 2 dr. (2. to 8.) to the fluidounce (30.) of water, work admirably. The two ointments which are recommended are precipitated sulphur, ½ dr. (2.) to the ounce (30.) of petrolatum; or if there is much crusting, ammoniated mercury, 20 gr. (1.3) to the ounce (30.) of either benzoinated lard or equal parts of lanolin and petrolatum.

Tinea circinata or *ringworm of the skin surface* is readily cured in most instances. Tincture of iodine may be painted on the affected patch daily; but, as a great majority of the cases develop in childhood, this preparation is apt to irritate the tender skin. Precipitated sulphur will rapidly effect a cure in these cases. It does not produce the irritation that the iodine compound does, and is therefore preferable. It is probably better to use the sulphur in a thick base so that it will be constantly in contact with the ringworm. A good formula consists of precipitated sulphur, ½ dr. (2.); powdered starch and powdered zinc oxide, each 2 dr. (8.); petrolatum, ½ oz. (15.).

This preparation cannot be washed off because of the starch, but can be readily removed by petrolatum or olive or sweet oil. This sulphur paste should be applied three or four times daily, first removing the former application. If a thin ointment base is used, such as petrolatum, it should be thoroughly rubbed into the lesion at every application. The surface treated should be covered with a thin layer of surgical gauze or a clean piece of old muslin or linen. The ringworm should be cleansed each night and morning with a mild soap and warm water. Other drugs also prove curative, such as ammoniated mercury or calomel, ½ dr. (2.) to the ounce (30.); one of the tar compounds mentioned under the treatment of scalp ringworm, in the strength of ½ dr. (2.) to the ounce; and iodine crystals, 15 gr. to ½ dr. (1. to 2.) to the ounce (30.) of goose grease. As sulphur is remarkably efficacious in the cure of ringworm of the skin surface it is usually unnecessary to seek further. *Tinea cruris*, the so-called eczema marginatum, readily responds in most instances to either a solution of the hyposulphite of sodium, ½ dr. (2.) to the fluidounce (30.) of water, or precipitated sulphur, ½ dr. (2.) to the ounce (30.) of petrolatum. If the hyposulphite solution proves too

drying, 10 to 15 minims of glycerin (0.65 to 1.) may be added to each fluidounce of the preparation. If greater penetration of the ointment base is required because of the depth of the ringworm, equal parts of lanolin and petrolatum or goose grease may be employed. Lotions are thoroughly mopped on the surface at least four times daily, and ointments gently rubbed into the diseased area the same number of times. It is frequently wise to use a lotion during the day and an ointment the last thing before retiring. Tinea cruris may be quite inflamed by the moisture and friction of the parts involved, and the strength of the germicidal drugs must then be reduced. If the patches are refractory to treatment an effective means of cure consists in the use of two different solutions: The first made up of the hyposulphite of sodium, ½ dr. (2.) to the fluidounce (30.) of water, and the second of glacial acetic acid, 20 minims (1.3) to the fluidounce (30.) of water, the second being applied before the first has become dried (Hartzell).

In cases of *eczematoid patches* on the hands and feet caused by the ringworm fungus, Whitfield has employed a 1 to 3 per cent chrysarobin ointment. He has also used in this type of case an ointment containing 3 per cent of salicylic acid and 5 per cent of benzoic acid.

TINEA VERSICOLOR.

Synonyms.—Pityriasis versicolor; Chromophytosis; Dermatomycosis furfuracea; Mycosis microsporia.

Definition.—A vegetable parasitic disease characterized by an outbreak of variously sized and shaped, slightly scaly, yellowish-brown spots, chiefly on the upper portion of the trunk.

Symptoms.—One or more large pin-head- to split-pea-size yellowish-brown slightly scaly, even with the surface or slightly elevated spots appear, in most instances upon the chest or upper portion of the back. New lesions slowly develop, and it may require several months before there are extensive areas of disease. The spots extend peripherally, united with others of a like character, and eventually the entire chest, the chest and upper abdomen, or the upper portion of the back may be involved in one sheet of eruption. In other instances the disease is limited to a few small patches. The lesions are covered with a very fine scale, hardly noticeable in some cases, unless the surface is gently rubbed with a blunt instrument. They are at times yellowish, dark brown, or slightly pinkish, but usually of a fawn or yellowish-brown hue. In extensive instances the shoulders, upper parts of the arms, the lower back, the buttocks, and the upper portion of the legs are attacked. The disease is noted in the pubic region in almost half of the cases in addition to the non-hairy skin involvement. The hair follicles

are, however, in no way involved. The exposed portions of the body are rarely attacked, excepting in the tropics, and in those cases the outbreak is frequently brownish-black, or in the dark skins rather whitish. There may be severe, mild, or an absence of itching.

FIG. 172.—Tinea versicolor. (From Dr. G. H. Fox's Atlas of Skin Diseases.)

Etiology and Pathology.—The disease is caused by the *microsporon furfur*, discovered by Eichstedt in 1846. Men are more frequently attacked. The affection is but mildly contagious and inoculation experiments have usually failed. The disease is

frequently observed in those who sweat freely. A relationship to phthisis has been cited, but they are absolutely non-related in any other way than by coincidence.

The fungus consists of mycelium, which is found in the horny layer of the epidermis and spores, the latter arranged in masses or clumps. The parasite is readily demonstrated microscopically. The scales are scraped on to a glass slide, a drop or two of liquor potassæ applied, covered with a cover-slip, allowed to stand for a few minutes, and then examined.

Fig. 173.—Microsporon furfur. (After Kaposi.)

Diagnosis.—The disease is readily distinguished from pigmented spots by the scale and the presence of fungus.

Prognosis.—The affection is readily cured, but there is a tendency to relapse because the underclothing is not properly or sufficiently disinfected.

Treatment.—As a prophylaxis against recurrence every article of clothing that touches the infected areas should be boiled for a full hour during the washing process.

The remedies which promote rapid recovery from the affection are precipitated sulphur, 1 dr. (4.) to ½ oz. (15.) each of lanolin and benzoinated lard; or the hyposulphite of sodium, 1 dr. (4.) to the fluidounce (30.) of water. The various tar compounds and the bichloride of mercury have been employed, the former in the

strength of ½ to 1 dr. (2. to 4.)to the ounce (30.) of the thin ointment bases and the latter ¼ to ½ gr. (0.016 to 0.03) to the fluidounce (30.) of water. None of these has proved so rapidly curative as the solution of the hyposulphite of sodium.

It would be well to start the treatment with a warm bath and plenty of Castile or boric acid soap, and, after the body has been thoroughly dried, to saturate the affected areas with the solution or rub in the ointment. Both bath and medication should be employed twice daily, night and morning.

TINEA IMBRICATA (TOKELAU).

Definition.—A vegetable parasitic disease, occurring in the tropics and characterized by the presence of extensive, flaky, scaly patches, the scales being large, tissue-paper-like, firmly adherent by their bases and arranged in concentric rings or parallel lines (Castellani).

Symptoms.—The eruption begins with one or several, round or oval, slightly raised, dark brown, very itchy patches. The central portion of each patch splits and a ring of large flaky scales attached at the periphery is formed. This scaly ring spreads peripherally, and another brownish patch appears in the center at the site of the first brown spot; the new brownish patch breaks and a second scaly ring is formed, and so on until a very large rounded area develops containing several concentric rings. The patches extend at the rate of a ¼ to ½ an inch a week. In a well-marked advanced case of the disease, practically the entire integument is covered with rounded patches, each of which presents several concentric, scaly rings, of a non-inflammatory character. The scales resemble tissue-paper, are dry, of a dirty grayish or brown color, from a fraction of an inch to ½ an inch in length. Each scale has a free border toward the periphery of the patch and is firmly attached at the opposite end. There are usually from eight to ten rings in each patch. Any portion of the skin surface may be attacked with the exception of the scalp. The nails may be involved and become much thickened, with a rough surface and deep cracks. The health is unaffected but the pruritus is intense. There may be an associated diffuse type rather than a concentric ring formation, but the rings are typical.

Etiology and Pathology.—The disease occurs in the tropics, among other locations in the Tokelau Island, from which it has been named, and in the Philippine Islands. A warm, damp, equable climate, with a temperature of 80° to 90° F., is particularly suitable for its development. Castellani has found the condition usually in young male adults, at times in old persons, and rare or absent

in infants and children, and chiefly in small villages or country districts.

The disease is caused by several species of the *endodermophyton* fungus, which take three to four weeks to develop on culture

FIG. 174.—Tinea imbricata. (Courtesy of Dr. E. B. Vedder.)

media. The affection has been inoculated into human beings by means of infected scales (Manson) and with pure cultures of the fungi (Castellani). The former requires eight to ten days and the latter twelve to twenty days. The fungus grows better between the superficial and the deep strata of the epidermis.

Diagnosis.—The concentric ring formation gives a distinct clinical picture.

Prognosis.—Cure is effected with difficulty. Itching may be intolerable. Very chronic cases may develop anemia, general weakness and emaciation.

Treatment.—Castellani uses routinely 1 to 2 dr. (4. to 8.) of resorcin to the fluidounce (30.) of tincture of benzoin, applied twice daily in localized cases. In those of somewhat generalized distribution half of the body is painted one day, the other half the next, and so on alternately. A very hot bath is also given once or twice weekly with sand soap. A 5 to 10 per cent chrysarobin ointment or iodine has also been employed successfully. Treatment has to be continued for some weeks.

ERYTHRASMA.

Definition.—A vegetable parasitic disease characterized by reddish-brown patches in the genito-crural and axillary regions.

Symptoms.—The eruption consists of well-defined brownish or brownish-red patches covered with fine bran-like scales. There may be only a few or many spots present, which gradually increase in size, coalesce, and form large areas. The disease is usually limited to the genito-crural flexures, the groins, gluteal cleft, and axillæ, locations where there is heat and moisture. Exceptionally it may spread to contiguous parts, or discrete patches may be observed on various portions of the body. There may be slight itching.

Etiology and Pathology.—The disease is rare in this country, but occurs more often in France and Germany, usually in males and after fifteen years of age. It is caused by the *microsporon minutissimum*, which is found in the superficial horny layer of the epidermis, and consists of short jointed threads and spores. The threads do not branch but show cylindrical swelling. The disease has been successfully inoculated, although it is only mildly contagious. It is doubtful if it has been successfully cultured.

Diagnosis.—Erythrasma is distinguished from tinea versicolor by the reddish tinge to the lesions, its practical limitation to areas of heat and moisture, areas not involved by the latter affection, excepting in conjunction with lesions on the typical location, the upper trunk. The fungus also in erythrasma is one-third the size of that found in tinea versicolor, and it shows no isolated collection of spores. The inflammatory character of tinea cruris and seborrheic dermatitis, and the presence of a different fungus in the former and the absence of any in the latter, differentiate these two conditions.

Prognosis and Treatment.—The disease is slowly progressive, but after reaching a certain development tends to remain stationary. Relapses are frequent after apparent cure.

The treatment is the same as for tinea versicolor.

PINTA DISEASE (CARAATE).

The disease is characterized by an outbreak of scaly spots, varying in color, either a gray, black, bluish-red, or dull white. The red areas are usually observed in the white races, while in negroes the lesions are commonly dull bluish-black. White areas are observed during the stage of involution. There are several forms of the affection, each probably caused by a separate organism. The disease runs a chronic course over a period of months or years. The hands and feet are in most instances first attacked, later the face and neck show involvement, although no portion of the cutaneous surface is immune. Clinically, excepting for the color and location, the lesions resemble markedly those of tinea versicolor. The general health is unimpaired.

Pinta disease is chiefly seen in the tropical portions of South America and among the Aztec Indians in the lowlands of southern Mexico, where it has existed for centuries.

The affection is due to several forms of *aspergillus* which attack the epidermis, and exceptionally the corium. The mycelium is composed of fine branching filaments with fructification at the termination of slender branches.

Treatment.—Treatment consists in the application of tincture of iodine, a 1 to 2 per cent ointment of chrysarobin, or one of the mercurial compounds suggested under ringworm.

MYRINGOMYCOSIS.

An affection characterized by scurvy, moist-looking, blotting-paper-like coating, of a dirty gray or brownish-gray color, with usually discrete, slightly raised, yellowish, brownish, greenish, or blackish points on the surface. The patch may be distinctly moist or with a glazed surface or crusted. The disease is limited to the external auditory canal, to the meatus, or to the entire channel, including the drum. The latter may eventually perforate. There is itching, stinging, at times, pain, a watery discharge, and impairment of hearing. It is supposedly of fungus origin.

Treatment.—Treatment consists in syringing with weak alkaline solutions, and, in addition, a 1 per cent solution of the hyposulphite of sodium or a solution of about 50 per cent alcohol.

ACTINOMYCOSIS.

Definition.—An affection due to the ray fungus and characterized by the development of sluggish, lumpy infiltration. Israel first recognized the specific cause which was named by Harz. The disease is either primary or secondary to infection of the mucous membrane.

Symptoms.—The affection usually occurs about the jaw, the neck, and the face. A hard, subcutaneous infiltration develops, and the overlying skin soon becomes dark red in color. The tumor formation softens, the skin breaks at several points, and a seropurulent, or blood-tinged discharge oozes from these multiple openings. Contained in the discharge are minute, friable, yellowish or yellowish-gray bodies, which consist of the ray fungi. The growth may be composed of nodules, covering a small or extensive area, and is of a dark red or bluish color, with numerous broken-down sinuses. In some instances the tumor is fungoid, papillomatous, and ulcerated; exceptionally it occurs on the fingers or other portions of the cutaneous surface, exclusive of the face. The affection tends to invade the deeper structures, such as muscles, bones, and even bloodvessels.

The affection usually runs a slow course, exceptionally rapid, and it at times requires months before there is extensive involvement. The subjective symptoms are frequently mild or absent, excepting during the suppurative stage when pain may be experienced. The lymphatics are only involved, if at all, secondarily as a result of the suppurative and late inflammation. The general health remains good unless pyemic infection occurs or the fungus attacks the deeper organs or structures.

Etiology and Pathology.—The disease is due to the *ray fungus*, a saprophyte which grows easily in the human body. Infection frequently occurs through the buccal mucous membrane of the gums. It is commonly contracted from cattle and horses, and therefore most often found in those who handle these animals. The habit among farmers, dairymen, and others of chewing straw, corn, and other grain, in which cereals the fungus flourishes, is etiological, infection occurring through a decayed tooth. The disease is observed more frequently in Germany and France than elsewhere. A break in the surface is considered necessary before infection can occur.

Pathology.—The organism is found in the pus or the lesions in the form of yellowish grains about $\frac{1}{250}$ to $\frac{1}{25}$ inch in diameter. The fungus consists of mycelium forming a small mulberry-like mass, with thick refractive, radiating processes. Cultures are difficult to obtain unless grown anaërobically. Bovines have been

successfully inoculated. The nodules consist of giant cells, plasma cells, and epithelioid cells, and a surrounding leukocytic and connective-tissue cell proliferation.

Diagnosis.—Actinomycosis is distinguished from dental abscess because it is less acute and less painful; from lupus vulgaris by the absence of deep-seated reddish-brown, apple-jelly-like nodules, and from scrofuloderm by the early lymphatic involvement in the latter. Syphilitic gummata break down early and have a characteristic kidney or serpiginous shape. Epithelioma frequently has a typical rolled border and pearly edge. All difficulty of diagnosis is cleared by the finding of the ray fungus.

Prognosis.—Actinomycosis runs a chronic and progressive course, but is materially improved if treatment is started early.

Treatment.—Large doses of potassium iodide are indicated. Surgical interference may be necessary. Roentgen-ray exposures may prove of use.

FIG. 175.—Mycetoma (Madura foot). (Courtesy of Dr. R. L. Sutton.)

MYCETOMA (MADURA FOOT).

Definition.—An endemic disease characterized by swelling and the formation of nodules which tend to break down, with sinus formation and disintegration of the affected part.

Symptoms.—The foot is usually attacked, although the hand, the knee or other regions may be involved. A papule or slight edematous swelling appears, which increases in size; new lesions

tend to develop. A well-developed case shows the involved part somewhat reddened, swollen, and a few or many nodules, usually toward the periphery of the patch. The nodules are elevated, hard or soft, some furuncular-like, others with a central opening from which leads a sinus running to the muscle or bone. There is a discharge from these sinuses containing small round, black, gunpowder-like bodies or "grains," or a substance resembling fish-roe, or the discharge is of either a whitish or reddish hue. Rarely pustules, vesicles, blebs, and abscesses may be added features. The disease runs a slow course, and after months or years the bony structures become destroyed.

Etiology and Pathology.—The disease is most often found in India and East Africa. Several vegetable organisms seem to be causal, a *streptothrix* closely related to the ray fungus, in other cases a form of *mucedo* and in others an *aspergillus*. A break in the surface is apparently necessary for infection, particularly in those who go barefoot.

Prognosis and Treatment.—The disease runs a chronic course over years, eventually destroying the affected parts.

Treatment consists of the administration of potassium iodide and excision.

BLASTOMYCOSIS.

Synonym.—Blastomycetic dermatitis.

The disease starts as a papule or papulo-pustule, which soon becomes covered by a crust, and the lesion slowly enlarges peripherally in the form of an indolent, flat, wart-like, or crusted papule.

Well-developed patches are elevated, the surface covered by irregular papillary elevations of a reddish color separated by clefts or fissures of varying depth, giving it a verrucous or cauliflower-like appearance. The border of the patch slopes more or less abruptly from the elevated, roughened surface to the normal skin, and it has a sharp margin. It is smooth, of a dark red or purplish color, from $\frac{1}{8}$ to $\frac{3}{8}$ of an inch in width, and contains a large number of miliary abscesses. Many are so small that they are seen only with a magnifying glass, while others vary in size up to a pin-head. Some are superficial while others are deep-seated. Abscesses of the same type are found on other portions of the growth. From the mucous or mucopus contained in these abscesses are obtained the organisms; the smaller the abscess the greater opportunity there is for obtaining a pure culture.

Large areas, especially those which have been untreated, are more or less covered with crusts, with an underlying lobulate structure bathed with seropurulent secretion. Bleeding readily occurs on the slightest touch from these crust-covered projections.

FIG. 176.—Blastomycosis. (Courtesy of Dr. C N Davis.)

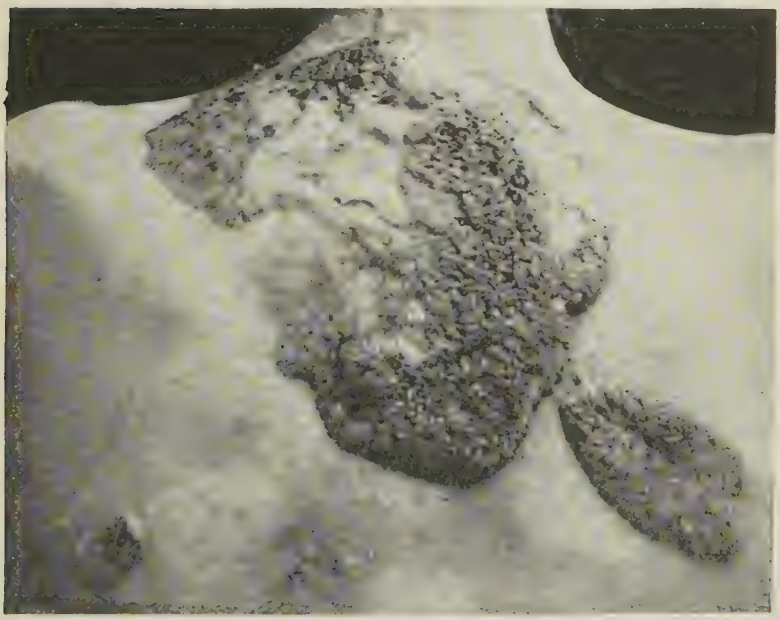


FIG. 177.—Cutaneous blastomycosis. (Ormsby.)

The papillomatous surface may be replaced in older lesions, in part, at least, with a thick, elevated, scar-like formation, pinkish-white in color, irregular and often corded, but with a smooth shining surface. The disease runs a slow, progressive course, months frequently elapsing before a patch reaches a diameter of an inch or more. In approximately one-half of the cases there is more than one patch present. Central healing may occur, with a resulting cicatrix.

The regions usually attacked are the face, hands, wrists, or forearms, although no portion of the cutaneous surface is exempt. The eyelids are rather often attacked, but the conjunctivæ are not involved. Lymphatic involvement is observed only in the systemic

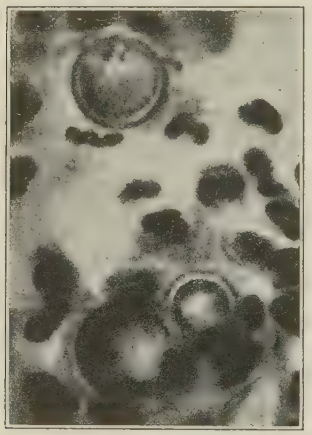


FIG. 178.—Budding organism in tissue. × 1200.

FIG. 179.—Hanging drop. × 1200.

Blastomycosis of the skin. From a photograph. (Ormsby.)

cases, excepting that pus infection of the lesions may cause a transitory enlargement of adjacent glands. Pain is absent except in acutely inflamed areas. The symptoms in the generalized cases resemble chronic pyemia with the formation of multiple abscesses. There is irregular fever and symptoms depending upon the organs involved. The general infection may begin in the skin, the lungs or bronchi.

The various viscera have been attacked in a few cases and death has resulted.

Etiology.—The cause of the affection is the *blastomyces*, a pathogenic yeast fungus, inoculated at a break in the skin surface. The disease has been most frequently found in Illinois, in the vicinity

of Chicago. Gilchrist was the first to discover the pathogenic organism, and Hyde, Montgomery, and Ormsby have seen the greatest number of cases.

The *blastomycetes* are found in miliary abscesses between the epithelial cells in the corium and are surrounded by inflammatory changes. They are rarely found within cells, except giant cells. There may be only a few of the organisms present or a very large number, appearing in pairs of unequal size, singly or in groups.

The *parasite* is a rounded, oval, or slightly irregular body having a well-defined double contour, a homogeneous capsule, and a finely or coarsely granular protoplasm which is separated from the capsule by a clear space of varying width. Fully developed organisms have a diameter of from 7 to 20 microns, often showing budding forms. In addition mycelium is present, which may contain few or many highly refractive bodies which are probably spores.

Guinea-pigs have been successfully inoculated and the organisms recovered from them. Histologically there is an enormous increase in the rete mucosum. The irregular processes contain minute abscesses filled with polynuclear cells, a few giant cells, and the organism. In the systemic cases the lungs show marked involvement, chiefly miliary and large-sized abscesses or cavities. The various viscera, bones, muscles, joints, brain, and the spinal cord have all been attacked by abscesses.

Diagnosis.—The affection is distinguished from warty tuberculosis by the typical border, containing miliary abscesses, but in certain cases, at least, a microscopical examination of the secretion from one of these minute lesions may be necessary. Lupus vulgaris, other tuberculoses, and the vegetating forms of syphilis have to be excluded, and also protozoic and coccidiodal infections. These latter infections may be varieties of blastomycosis.

Prognosis.—The localized form of the disease yields to proper measures. The systemic form in a great majority of instances terminates fatally.

Treatment.—Excision of the lesion, curettement, or roentgen-ray treatment is advocated. Large doses of potassium iodide should be administered internally. Hyde advocated in resisting cases as much as 200 to 500 gr. (13.3 to 33.3) daily.

SPOROTRICHOSIS.

Schenck, in 1898, was the first to call attention to the present disease, and later De Beurmann has added greatly to our knowledge of the subject.

Symptoms. Various lesions have been found in this affection. The outbreak resembles the skin manifestations of syphilis, tuberculosis and pyogenic infection.

The lesions are soft nodules without any tendency to ulcerate, or gummatous lesions which tend to break down and not infrequently follow the course of the lymphatic channels. Various diseases may be simulated, such as verrucous tuberculosis, the ulcers of Bazin's disease, ulcerating tertiary syphilis, ecthyma, and furuncles. Scars resembling those of syphilis may result. The mucous membranes may be attacked with subsequent ulceration. There may be a few or quite a number of lesions present.

FIG. 180.—Sporotrichosis. (Courtesy of Dr. R. L. Sutton.)

Etiology and Pathology.—The cause of the affection is a specific vegetable organism, the *sporotrichia*, which gains entrance through some trivial trauma of the skin or mucous membrane, or the site of the infection is undetermined. The sporotrichia belongs to the mucedo group, and consists of mycelium with regular septate or continuous filaments, having short spore-bearing branches. The spores are 3 to 6 microns in size, and occur singly or in pairs. De Beurmann has been successful in the inoculation of animals.

The lesion consists of three zones: A perivascular, cellular infiltration, a tubercular-like infiltration with giant cells, and a central suppurative portion, with polynuclear infiltration (De Beurmann). The organism is obtained in pure cultures from the abscess-like lesions in from six to eight days after inoculation, and

appears first in round white colonies, which later spread, become wrinkled, and dark-colored. It may be grown in bouillon or Sabouraud's special media.

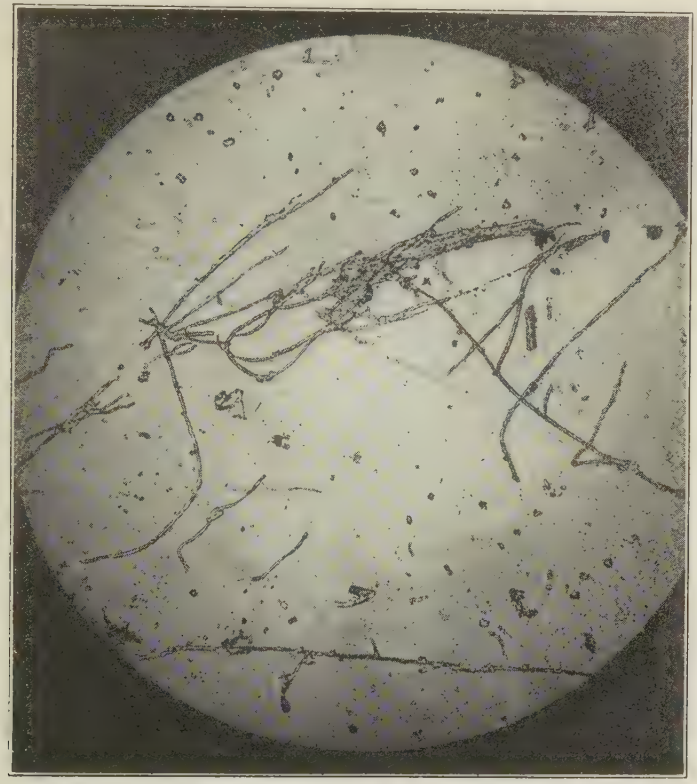


Fig. 181.—Sporotrichium Schenckii, seven-day agar culture. (Courtesy of Dr. R. L. Sutton.)

Diagnosis.—The diagnosis usually has to be based upon the finding of the fungus, although in some instances the indolent abscess-like lesions following the lymphatic channels are suggestive.

Prognosis.—Prognosis in most instances is favorable.

Treatment.—Surgical intervention and potassium iodide in large doses are indicated.

NOCARDIOSIS CUTIS.

Guy has recently reported a condition which resembles clinically sporotrichosis. The causative fungus is nocardia, a species of actinomycetaceæ (Holman). Potron and Thiry, previously, in 1913, described an example. The hair shafts of the axillæ and groin may be attacked when the condition is termed trichonocardiosis.

Dec 10-26

CLASS 10.

ANIMAL PARASITIC DISEASES.

SCABIES.

Synonym.—The itch.

Definition.—An animal parasitic disease characterized by the presence of burrows, a generalized eruption, exclusive of the face, and accompanied by intense itching at night.

Symptoms.—The disease is diagnosed by a minute zig-zag track, varying from the smallest fraction to $\frac{1}{4}$ of an inch in length, produced by the mite burrowing into the epidermis. This track or burrow shows alternating black or brownish-black and white dots, the former being excreta and eggs laid by the female. The burrows are found in the upper part of the horny layer of the epidermis, where the skin is thin, warm, and there is more or less moisture; therefore on the webs and lateral surface of the fingers, the flexures of the wrists, the axillary folds, on the shaft of the penis in the male, and around the nipple in the female. It may be found elsewhere on the skin surface, as on the palms of the hands. There may be but the one discovered, as the rest may have been scratched open and pustules have taken their places. Burrows are also only exceptionally found on the hands and fingers of those whose hands are in water, oils, or grease a considerable portion of the time.

There is a multiform eruption produced by the rubbing and scratching, consisting of papules, vesicles, pustules, and eczematous areas. This outbreak is chiefly observed upon the hands, the fingers, the flexure surface of the arms, the axillæ, the anterior surface of the trunk, the buttocks, the flexure surface of the legs, chiefly the popliteal spaces, the ankles, the feet and the toes, on the breasts, chiefly around the nipples in the female, and upon the penis in the male.

The face is never attacked in the adult or in childhood, the one exception being the nursing infant, infection of the face occurring from the numerous lesions usually found near the nipple of the mother.

The itching is so severe that frequently the patient is kept awake a great portion of the night. There is very little pruritus during the day. The itch mite does not start to migrate from its burrow until the patient's body is thoroughly warmed up in bed at night; the mite then migrates over the surface of the body and the itching is almost unbearable. The greatest itching, therefore, is complained of one or two hours after the patient has retired, and it may continue the greater part of the night.

FIG. 182.—Scabies, showing distribution. (Courtesy of Dr. G. H. Fox.)

Etiology and Pathology.—The cause of the affection is a diminutive animal parasite, the *sarcoptes scabiei* (acarus scabiei). The female is just visible to the unaided eye, and the male is smaller.

The sarcoptes have eight short legs, the four anterior provided with suckers, and the four posterior with bristles; the larvæ having but six extremities. The impregnated female alone burrows, the male acarus lives on the surface. The ovæ which are laid in the burrows hatch out in about a week and the young embryos migrate to the surface.

FIG. 183.—Scabies (showing pustules on flexure surface of wrist). (Courtesy of Dr. Sequeira.)

The disease is extremely contagious, but infection develops only upon close contact with infected individuals or with articles containing the itch mites.

Diagnosis.—Scabies is to be chiefly differentiated from pediculosis corporis and eczema.

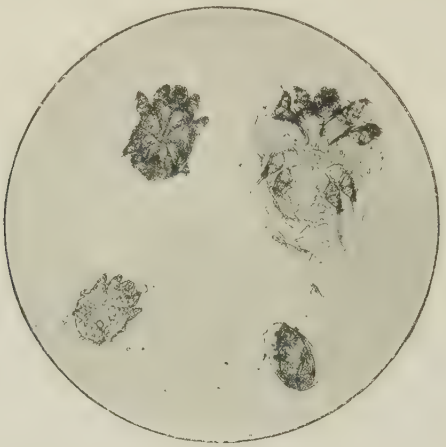


Fig. 184.—Sarcoptes scabiei. The male (smaller), the female (larger), and the ovæ. (Courtesy of Dr. Sequeira.)

Scabies.	Pediculosis Corporis.	Eczema.
Burrows prove the diagnosis; contagious by contact.	Pediculi in the seams of the underclothing or on the body is diagnostic; contagion by contact.	Absence of burrow or pediculus; non-contagious.
Attacks the hands, webs and lateral surface of the fingers; face is free; feet attacked.	Hands and face and feet are unattacked.	Palms of hands and face frequently involved in somewhat general case.
Itching most marked at night, one or two hours after retiring.	Itching at night, starting with the removal of the clothes.	Itching both day and night.
Eruption multiform involving chiefly the flexure surfaces, the axillæ, the anterior surface of the trunk, the penis, and surrounding nipple in female.	Attacks chiefly extensor surface of the upper portions of the extremities and the posterior surface of the trunk, chiefly across the shoulders; lesions usually punctate hemorrhages and long scratch marks.	Reddened and thickened patches, with more or less oozing, fading off into the sound skin; no predilection for either surface of the extremity or the anterior or posterior surface of trunk.

Prognosis.—The disease is readily cured but to avoid relapses all the infected members of the household should be treated.

Treatment.—The treatment and the cure of scabies is a very simple matter if the full details are thoroughly emphasized to the patient. It is to be remembered that the omission of any small portion of the instructions may lead to making the condition worse and in prolonging and preventing the cure. In the beginning it is

well to realize the logic for each stage of the procedure. The first indication is naturally the killing off of all the animal parasites that cause the affection. As the itch mite comes to the surface to breathe it is necessary to have the germicidal ointment constantly in contact with every portion of the body attacked by the disease, so that the parasite is killed when it pokes its head out of the burrow.

The directions, therefore, are given the patient to rub the ointment on the entire cutaneous surface, with the exception of the face and the scalp, as these latter areas are not attacked by the disease, excepting the nursing infant; this procedure is carried out for four nights in succession. On the fifth night a warm bath is taken, using plenty of white Castile or boric acid soap. After the ointment has been removed by the bath the patient's body should be thoroughly examined to determine whether the skin has been irritated by the germicidal application. If the patient's skin is somewhat inflamed, but there are still evidences of the disease, such as burrows and pustular lesions, two or three days should elapse to allow the inflamed condition of the skin caused by the germicidal ointment to subside, and then another series of rubbings for four nights in succession should be instituted.

Another warm bath should again be taken on the fifth night. The two series of rubbings cure practically every case of scabies. It is not necessary to bathe before starting the germicidal treatment, because the ointment is the curative portion of the treatment and soap and water have no effect in the eradication of the disease. The same underclothes and bedclothes should be used during the treatment, as the preparations employed are apt to stain. Next to the germicidal ointment which destroys the cause of the disease in the skin the most important measure is the thorough disinfection by means of boiling water of all those clothes, the nether garments, the nightclothes and the sheets on the bed which touch the patient's body, in order to kill the mites which may be present.

A great many germicidal preparations are curative in scabies, but as none are better than sulphur, we use this in the majority of our cases. Although the English are fond of the sublimed sulphur, we prefer the precipitated, as the latter is more finely divided and of a less gritty consistency and can therefore be more readily rubbed up into a smooth ointment. Precipitated sulphur is used routinely in these cases in the strength of 1 dr. (4.) to the ounce (30.) of a thin ointment base, such as petrolatum, equal parts of petrolatum and lanolin, benzoinated lard, or cold cream. In warm weather 2 to 4 dr. (4. to 8.) of lanolin should be combined with the other bases mentioned, otherwise they are almost too thin for use. The balsam of Peru, not only because of its pleasant odor

sulp. præcip ℥ iv
Lanolini ℥ i
Ung. ag. Rosæ qs ad ℥ iv

but also for its germicidal action, may with advantage be combined with the sulphur preparation in the strength of ½ dr. to 1 dr. (2. to 4.) to the ounce (30.). Betanaphtol may be used in the strength of 30 to 40 gr. to the ounce (30.) in the treatment of this condition, or may be employed in combination with sulphur, 1 dr. (2.) to the ounce (30.). Numerous other preparations of a germicidal character have been suggested for the treatment of the adult with the "itch," but as they have no advantages over those therapeutic measures just mentioned, and may have great disadvantages, there is, therefore, no reason why they should be considered. I would like, however, to emphasize that under no circumstances should any mercurial ointment be used over such a large surface, not even ammoniated mercury, because of the dangers of ptyalism. Kaposi's naphtol ointment is a pleasant preparation to use, and consists of 15 parts of betanaphtol, 10 parts of precipitated chalk, 50 parts of soft soap and 100 parts of lard. Sequeira suggests 1 oz. (30.) of balsam of Peru; 2 oz. (60.) of sublimed sulphur; ½ oz. (15.) of potassium carbonate and 6 oz. (180.) of lard.

The rubbing of an ointment over the greater portion of the cutaneous surface and allowing it to remain for four days is disagreeable at best, and therefore I believe that as satisfactory a preparation as any consists of precipitated sulphur, 4 dr. (15.), 1½ oz. (45.) of lanolin, and 2 oz. (60.) of petrolatum, the 4 oz. being sufficient for four nights of treatment.

The sulphur ointment should be used one-half as strong for a child from three to ten years, and from ten to twelve, 40 gr. (2.6) of precipitated sulphur to the ounce (30.) of the base; above twelve years the same strength preparation is employed as for an adult. Balsam of Peru, 1 dr. (4.) to the ounce (30.) of the base, has been used in the treatment of young children under the age of three years, the sulphur being omitted from the prescription. The mildest germicide and the least irritating to the skin of the very young child and the nursing infant is storax (styrax), a liquid balsam which is combined with an equal quantity of olive oil and the usual scabies procedure followed.

Not infrequently after the second series of rubbings in the treatment of scabies the patient returns to the office and mentions the fact that the itching is quite severe, but noticed just as severely during the day as at night. You then know that the germicidal ointment has inflamed the skin, setting up a dermatitis. The scabies has been cured as the patient has carefully followed your instruction, and your present indication consists in soothing the irritated skin. Mild antipruritic lotions, dusting powders, or ointments, such as are suggested under the treatment of acute eczema, should be used for this purpose.

As scabies is an exceedingly contagious disease, the patient should be warned to sleep alone, and to allow no one to touch the infected clothing.

PEDICULOSIS.

Pediculosis, or lousiness, is the term applied to invasion of the skin or the hairs by pediculi. There are *three varieties* of *pediculi:* The first, *pediculus capitis,* attacks the scalp; the second, *pediculus corporis,* the general surface and the clothing; and the third, *pediculus pubis,* chiefly the pubic hairs and in addition the hairs in the axilla, those scattered over the surface of the body, the eyebrows, the eyelashes, and rarely the mustache and beard.

The *head* and *body lice* resemble each other markedly. The former is $1\frac{1}{5}$ to $3\frac{1}{5}$ mm. in length, or about one-third less in size than the latter, which varies from $1\frac{1}{5}$ to $4\frac{1}{5}$ mm. long. They are a little less than half as wide as long. The male is smaller than the female. The sexual organ of the former is found on the dorsal surface, and consists of a wedge-shaped, protruding, and relatively large structure; the vaginal opening of the female is located in the ventral surface. These parasites have an elongated oval body, with six strongly jointed legs with stout claws, which are attached to the thorax of the animal. The abdominal portion shows lateral deep notches. The *head louse* has a rounded acorn-shaped head; the *body louse* one of an oval contour, and both have two prominent eyes and two antennæ. They are of a grayish color, with blackish margins. Both, but particularly the pediculus corporis, have a reddish tinge after feeding on the blood of the victim.

The *pediculus pubis,* or crab louse, is shorter than either of the other varieties, the thorax and abdomen are not divided, and the head is seated squarely on the body. It varies from $\frac{1}{2}$ to $\frac{1}{10}$ mm. in length, and its breadth is almost equal to its length. Eight teat-shaped feet terminating in jointed claws are attached to the margin of the abdomen. It is of a grayish-yellow color and more or less translucent.

These parasites are very productive. The pubic variety hatches out fifteen to twenty eggs, and the other, fifty or more. They multiply rapidly, hatching out within a week, and reaching full sexual powers in less than two weeks more.

Pediculosis is divided into three varieties, depending upon the areas attacked: *Pediculosis capitis, pediculosis corporis,* and *pediculosis pubis.*

Pediculosis Capitis.—The affection is characterized by the development of a few or many "nits" attached to the scalp hairs. The nit is firmly attached to the hair, and although there is usually

but one, there may be several on a single hair. They hang from the hair in the direction in which it grows. The ovæ or nits are white, pearl-like, shiny, oval, translucent, small pin-head-sized bodies which are attached to the hair by a collagenous collar. The outer portion consists of a gelatinous, albuminous material. If

Fig. 185.—Pediculus capitis.

the embryo is dead or has been hatched out the ova becomes a dirty yellow color, is lusterless, and therefore the distinction between an inhabited or harmless nit is easily distinguished. Live pediculi may be also found in some of the cases crawling over the scalp.

The itching associated with the condition is frequently intense; the patient naturally scratches and a secondary pus infection may ensue. Large pustular lesions, therefore, may be found secondary

Fig. 186.—Pediculus capitis. Ovæ in various stages of development on a scalp hair.

to scratching on the scalp, and not infrequently upon the face; sometimes on the neck and hands. *Impetigo contagiosa* frequently is directly caused by a pediculus invasion of the scalp. Eczematous areas may likewise be produced by the irritation of the disease plus the scratching and rubbing. From the scratching and second-

ary staphylococcic infection there may be an enlargement of the lymphatic glands of the neck, usually the posterior or anterior cervical; lymphangitis in most instances is non-inflammatory, but at times there is suppuration. If the condition is present over a long period the child may become anemic. In neglected instances there may be a distinctive unpleasant odor. Exceptionally in the worst type of cases the hair becomes matted together into a thick mass and an affection termed "plica polonica" is observed.

The affection is more common in children than in adults, and in the female sex. It is readily communicated in schools, institutions, etc., from brushes, toilet articles and so forth.

The presence of the nit or pediculus readily distinguishes the affection from other diseases.

Treatment.—If the inflammatory symptoms are not marked and there are but few pustular lesions, the best mixture to be prescribed consists of the bichloride of mercury, $\frac{1}{2}$ gr. (0.03); glacial acetic acid, 20 minims (1.3); water, 1 fl. oz. (30.). The bichloride of mercury kills the animal and the acid softens the albuminous and gelatinous shell of the egg. The patient's scalp should first be washed with plenty of warm water and a mild soap, such as Castile or boric acid, the suds remaining in contact with the hair for five to ten minutes, because of their softening effect. The hair should be washed each day for a week. The germicidal lotions should be applied thoroughly twice daily. The hair should be thoroughly combed once or twice daily with a fine-toothed comb. As the nit is attached to the hair shaft in the direction in which the hair grows, the method of combing the hair should be reversed, as by this measure not infrequently the nit catches between the closely placed teeth of the comb and is thereby removed, while by the routine method the nit usually passes between the teeth without being detached. If there is a considerable amount of inflammation present, or if the crust formation is a marked feature, an ointment is indicated, consisting of ammoniated mercury, 20 to 30 gr. (1.3 to 2.) to the ounce (30.) of petrolatum or cold cream. As a further antiseptic or germicidal precaution, salicylic acid, 5 to 10 gr. (0.32 to 0.65); salicylate of soda, 10 to 20 gr. (0.65 to 1.3); or boric acid, 20 to 40 gr. (1.3 to 2.6), may be added to the other ointment. Precipitated sulphur, 20 to 40 gr. (1.3 to 2.6) to the ounce (30.) of the ointment base, may be substituted for the ammoniated mercury, but the latter prescription is more irritating than the white precipitate ointment and not so curative for the pustular lesions. The time-honored kerosene oil can be used to kill the pediculi, but it is not so efficacious for the removal of the nits and the killing of the embryos as the preparations mentioned above. If coal oil is used, the application should be made during

the day to avoid the possibility of fire, if applied close to the light in the evening.

If there is marked enlargement of the glands of the neck an ointment is required for soothing and absorptive purposes. There is no better preparation for this purpose than ichthyol salve, consisting of ichthyol, 2 dr. (8.) to 6 dr. (24.) of petrolatum. It will

FIG. 187.—Pediculosis corporis (showing the distribution and types of eruption). (Courtesy of Dr. George H. Fox.)

be found desirable in warm weather to thicken this prescription by the addition of from 1 to 2 dr. (4. to 8.) of powdered zinc oxide and to reduce the petrolatum sufficiently to make the compound 1 oz. (30.), therefore a 25 per cent ointment.

Pediculosis Corporis.—Pediculosis corporis, pediculosis vestimenti, or lice of the body, is caused by a tiny animal approximately the size of a very small pin-head. The little parasites are found

in the seams of the patient's underclothes or on the skin surface. It lays its eggs in the underclothes or on the integument.

There are three characteristic signs we look for in this disease: The animal; long linear scratch marks; and small punctate hemorrhages. The linear scratch marks have been produced by the patient's nails because of the intense itching, and the punctate hemorrhages have been caused by the little animal putting its head into the skin and sucking the blood from its victim, a small pin-head-sized red puncta remaining after the animal has withdrawn its head.

FIG. 188.—Pediculus corporis.

In pediculosis corporis the face is unattacked and the hands and feet are likewise free of eruption. The lesions are observed on the extensor surface of the extremities. The most marked outbreak is noted across the shoulders and the lower portion of the back; there is comparatively little eruption on the anterior surface of the trunk. The axillæ are free and also the flexure surface of the extremities. The penis shows no lesions, and neither do the breasts of the female. The sites of the outbreak can be very easily explained if we only recall the fact that the lice are in the seams of the underclothes and therefore the lesions are found where the animals are in contact with the skin surface. The itching is most marked at night, when the patient removes the underclothes. This has the natural explanation that with the removal of the underclothes the animals are disturbed in the seams of the nether garments and crawl upon the surface of the skin; the crawling of these animals

where the seams of the underclothes have rested causes intense itching; the patient literally claws the skin, causing excoriations and long, linear scratch marks.

In addition to the characteristic lesions mentioned above, the whole of the attacked surface of the body may become deeply pigmented, the epidermis thickened and covered with scabs and crusts from secondary infection. These changes are mainly due to the constant scratching and dirt.

Pediculosis corporis is more frequently found in the adult, especially in those past middle life, rather than in the child. The uncleanly are most often attacked, so much so that the affection has been termed "vagabond's disease."

Diagnosis.—The disease has been differentiated from eczema and scabies under the latter affection. It is differentiated from urticaria by the wheal formation, the face involvement, the absence of punctate hemorrhages, linear scratch marks, and pediculi in the latter affection. It is distinguished from grain itch by the wheal and vesicle formation and the absence of the pediculus in the latter disease.

Treatment.—As the animal parasites are found on and not in the skin in pediculosis corporis, a germicidal ointment is not necessary to effect a cure. A warm bath with a plentiful use of soap, such as Castile or boric acid, destroys all the parasites on the skin surface. In addition, all the patient's underclothes, nightclothes, and the sheets on the bed should be thoroughly boiled to kill the pediculi in these garments. The only other indication is to soothe the skin and to eradicate the itching. A phenol lotion is our first thought; a good formula consists of phenol, 7½ gr. (0.5), powdered talcum, powdered zinc oxide, or one of the bismuth powders in the strength of ½ dr. (2.); glycerin, 10 minims (0.6); camphor-water, 1 fl. oz. (30.). If the pruritus is very marked, ¼ gr. (0.016) of thymol or 1 gr. (0.06) of menthol may be added to each fluidounce (30.) of the mixture. This preparation may be applied freely and frequently without danger of poisoning from absorption if the body is not bandaged. The other antipruritic preparations mentioned under acute eczema may be used with impunity and efficacy in this condition.

Pediculosis Pubis.—This affection is caused by a small pin-head-sized animal, smaller than either of the other two varieties of pediculi, which bears resemblance to a crab; hence the term crab-louse, or the popular name for the disease, "crabs." The little animal is frequently found as a black dot at the entrance to the hair follicle, with its head buried in the skin. It lays its eggs on the shaft of all hairs of the body, excepting those of the scalp. The disease attacks, in the great majority of cases, the pubic region

alone or the contiguous hairs. The itching is intense, and scratching may give rise to secondary pustular lesions. The nits are of similar shape and attached to the hairs in the same manner as those of the head louse, but are of a brownish instead of a whitish color.

The preparations suggested for the treatment of pediculosis capitis are equally efficacious in this affection. For many years the official ointment of mercury, "blue ointment," has been used in the treatment of this disease, but it has several disadvantages: First and foremost, there is a very grave danger of ptyalizing the patient; second, it is apt to cause a dermatitis when vigorously applied; and third, it is both disagreeable in odor and in application. Ammoniated mercury, 30 or 40 gr. (2. to 2.6) to the ounce (30.) of a thin ointment base, has neither of the last two disadvantages,

Fig. 189.—Pediculus pubis.

and is not nearly so apt to ptyalize the patient. If there is a considerable amount of irritation of the skin even beyond the areas attacked by the parasites, a phenol lotion, $7\frac{1}{2}$ gr. (0.5) to the fluidounce (30.) of water, may be indicated in addition to the germicidal preparations.

All those clothes which are in contact with the diseased areas should be thoroughly disinfected. An hour's immersion in boiling water eradicates the danger of reinfection from this source.

GRAIN ITCH (STRAW ITCH).

The eruption in its most typical form consists of lesions resembling markedly those found in both urticaria and varicella—a wheal surmounted by a vesicle. In addition, there may be discrete papulo-vesicles and vesicles pin-head in size. The tops of some of

the lesions may be scratched off and a minute blood-crust is observed. The hands, the feet, and the face are rarely attacked. The majority of the outbreak is observed upon the trunk; the extremities show much less involvement. The itching is most severe at night, particularly after the patient has been lying on the infected mattress for some hours. In well-developed cases there is not infrequently, in the first few days, slight fever, with other

FIG. 190.—Grain itch. (Courtesy of Dr. Schamberg.)

mild systemic symptoms. Rawles and Schamberg noted slight albuminuria in a small proportion of cases, and the latter found a moderate leukocytosis in most patients and a well-marked eosinophilia in many.

Etiology and Pathology.—Any age may be attacked. This disease is usually seen in the spring or the autumn. It is observed in those who come in contact with infected straw or grain, either by sleeping

on mattresses or in those handling these cereals, or by means of infected clothing and bedcoverings.

The disease is caused by a diminutive mite, much smaller than a pediculus, which has four pairs of legs. They reproduce rapidly and reach sexual maturity shortly after birth. The mite can usually be detected in the dust of straw or grain with a moderately powerful magnifying glass. They do not burrow into the skin as does the itch mite, but probably only pierce it momentarily to obtain nourishment, and apparently at the same time inject a toxic substance.

FIG. 191.—Pediculoides ventricosus. (Courtesy of Dr. Schamberg.)

Goldberger and Schamberg were the first to prove that the *pediculoides ventricosus,* the mite first identified by Newport (1850), was the cause of this characteristic outbreak.

The pathological changes in the skin are those characteristic of the lesions of urticaria (Schamberg).

Diagnosis.—The disease is easily differentiated if the history is obtained of sleeping on a new straw mattress, by the wheal-like lesion with a vesicle on the summit, the marked number of lesions on the trunk, fewer on the upper portion of the extremities, and none on the hands, feet, and face, and the itching worse at night. (To distinguish this condition from pediculosis corporis and scabies, see under Diagnosis in the latter disease.)

Prognosis.—If the cause is removed the patient rapidly recovers.

Treatment.—The first indication in the treatment of grain itch consists of getting rid of the straw in the mattress and the substi-

tution of fresh straw that has been properly dried and treated. Apparently the bulk of the infected straw has come from certain portions of New Jersey, although other sections of the country have reported the condition as well. The mattress can also be subjected to dry heat and the parasites thereby killed.

The same safeguard should be employed with all infected cereals. The parasite is apparently killed if the straw is kept for some months, particularly during a winter, the cold weather acting as a cure for the diseased straw. The patient should be warned, therefore, to immediately stop sleeping on the disease-producing mattress.

In this condition a germicidal ointment is also indicated to kill all of the minute animals that have attacked the skin. The germicidal ointment is used only about one-half the strength of the preparations prescribed in scabies treatment. A good prescription consists of precipitated sulphur, 3½ dr. (2.); betanaphtol, 15 gr. (1.); lanolin, 2 dr. (2.); petrolatum, 5 dr. (20.). The therapeutic measure should be used at bedtime, for four nights in succession, every portion of the body being annointed except the face and the scalp. A warm bath is taken the fifth night to remove the germicidal ointment from the skin surface. A second series of rubbings is seldom required in this condition. If the skin still remains irritable and pruritic, one of the antipruritic and soothing preparations mentioned under acute eczema may be used.

Prairie itch, swamp itch, Ohio scratches, Texas mange, lumbermen's itch, etc., are probably closely allied conditions, and are also caused by the same mite—the pediculoides ventricosus.

COPRA ITCH.

Copra is derived from cocoanuts, and frequently workers in copra mills are attacked by a pruritic outbreak which resembles scabies, excepting for the absence of burrows. It has the same distribution as the latter affection. The disease is caused by a small animal parasite found in the copra dust which crawls over the surface of the body rather than burrows into the skin. Castellani inoculated the disease by rubbing the dust containing the parasite into the skin, and also by placing the animals alone in the cutaneous surface under a bandage. The eruption disappears spontaneously upon stopping work in these mills.

Castellani found the condition was readily cured by the nightly application of a 5 to 10 per cent betanaphtol ointment.

IXODES (TICKS).

The wood-tick is a minute parasite which inhabits bushes and trees, usually pines. It is fond of human blood, inserting its pro-

boscis into the skin to obtain this fluid. If not disturbed it remains for several days, dropping off when gorged with the blood to its full capacity, swelling to several times its natural size. The fever-producing tick of animals also attacks the human skin, and has a diamond-shaped white mark, easily discernible on the center of

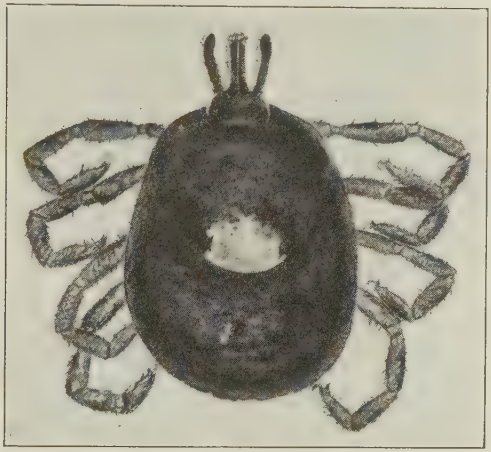


FIG. 192.—Tick, very highly magnified.

the body. Turpentine, paraffine, or moist tobacco applied to the head of the parasite kills it, and it releases its hold. If forcibly removed the proboscis may remain in the skin, giving rise to considerable pain and inflammation, the latter, at times, resembling a blind boil. A small more or less persistent itchy and painful wheal marks the site of attack.

DERMATITIS DUE TO CARPOGLYPHUS PASSULORUM.

Oliver and later O'Donovan have recorded a papular dermatitis of the forearms which develops in plum and fig laborers. This outbreak is due to the carpoglyphus, a small mite which shows an absence of a suture between the cephalothorax and abdomen, and has peculiar claws, a distinctly shaped hair on the torsi of the first and second legs.

MYIASIS CUTANEA.

The skin may be attacked by the larvæ of certain flies, particularly those of the families of muscidæ and œstridæ. The former deposits its eggs on the surface of open wounds, such as burns and other suppurating granular surfaces. The latter punctures the skin and inserts its ova immediately beneath the

surface, where they develop and give rise to furuncular-like lesions which ultimately break down and allow the larvæ to escape. Various varieties have caused an outbreak such as the screw worm fly, the "Macaw worm" (dermatobia noxialis), Lucilia cæser, Lucilia pilatei, Lucilia sericata, chrysonyia macellaria, dermatobia hominis, etc. The outbreak is observed chiefly in tropical and subtropical countries, and occasionally in the temperate zone.

AMŒBIASIS CUTIS.

A chronic inflammatory disease of the skin due to infection with an amœba has recently been reported by Engman and Heithaus. Two clinical forms are described; a continuous, progressive, open, frank ulceration, and circumscribed, amœbic abscesses. Variant types of these two varieties may be obersved.

LEPTUS AUTUMNALIS (HARVEST BUG).

The leptus is the larva of an insect which attacks the human skin, usually in July and August. Its chief sites of involvement are the legs and ankles. The affection is produced by the burrowing of the head of the parasite in the epidermis. A violent irritation is produced, with reddish papules and wheals. Secondary lesions may be produced by scratching. The applications which give the greatest relief are carbolic acid in olive oil or sulphur ointment.

BROWN-TAIL MOTH DERMATITIS.

An affection caused by the "nettling" hairs of the brown-tail moth, its cocoon and caterpillar. It has been reported in this country, in New England, a part of Canada and the Western States.

The lesions consist of discrete or grouped erythematous macules or urticaria-like lesions. In severe instances there may be large patches of inflammatory redness, swelling, or plaques resembling an acute eczema or dermatitis. The itching is usually severe. The outbreak lasts from a few days to many weeks, depending upon its original severity. The face, neck, arms, and upper portion of the trunk are most often attacked, although it may be limited to one or more small patches, or, exceptionally, from infested clothing, generalized. In extensive cases there may be symptoms of a mild toxemia.

The outbreak is usually observed in the latter part of May or June, about the time the caterpillar reaches its full growth. Infection not only occurs from direct contact, but by contact with clothing in which the hairs have been lodged. The eruption is

not only caused by the mechanical irritation, but also because of some irritating substance contained in the penetrating hairs. This substance causes some reactionary changes in the red blood corpuscles (Tyzzer).

The most efficacious treatment consists in bathing the surfaces, if not too extensive, with mercuric chloride lotion (1 to 1000 or 1 to 2000) and painting each spot with flexible collodion (Holland). In extensive cases a mild antipruritic lotion or ointment, such as suggested under acute eczema, is indicated. It may be rather rebellious to treatment.

PULEX PENETRANS (JIGGER, OR SAND-FLEA).

An almost microscopical parasite, observed in our southern states and in the tropics, resembling the common flea except for its long proboscis, enters the skin, usually of the feet and toes, at times elsewhere, to lay its eggs. An inflammatory swelling, vesicle, pustule, abscess, or even ulceration is produced. The parasite may give rise to considerable disturbance with adenitis. Treatment consists in the removal of the animal with a blunt needle and turpentine, chloroform, or carbolic acid is applied.

PULEX IRRITANS (COMMON FLEA).

The bite of the flea causes a minute hemorrhage into the skin, with a red areola, and at times a wheal is formed. Americans in certain portions of Europe suffer considerably from this pest, but they are usually most bothersome in tropical climates. In women particularly vulnerable to these insects the wearing of a lump of camphor in a cheese-cloth bag under the clothing may serve as a partial protection against these pests. The various antipruritic lotions mentioned under acute eczema are efficacious.

CIMEX LECTULARIUS (BED-BUG).

The lesions caused by this small animal are more inflammatory than those produced by fleas. There is a central hemorrhage where the blood has been sucked, and around it a wheal or a papule. This purpuric or hemorrhagic spot remains for some days, a week or more, after the swelling subsides. Although any portion of the cutaneous surface may be attacked, the lesions are usually observed on the lower portion of the legs.

The treatment is the same as for flea bites.

CULEX (GNAT, OR MOSQUITO).

Gnats or mosquitoes give rise by biting to erythematous spots or wheals. In addition in certain individuals there may be considerable swelling.

Other animals such as bees, wasps, spiders, ants, caterpillars, etc., give rise to lesions which are mostly urticarial in appearance. Bees and wasps if the stings are numerous may cause serious effects, in extreme instances death has resulted. Some species of spiders can also produce alarming consequences, a poisoned wound developing at the point of attack, and followed by systemic symptoms. The exposed parts are those usually attacked.

Treatment.—Treatment consists of the antipruritic preparations mentioned under acute eczema. To alleviate wasp- and bee-stings common earth or clay made into a paste with water should be applied.

ŒSTRUS (GADFLY, OR BOTFLY).

A disease of not uncommon occurrence in Central and South America, exceptionally met with elsewhere, caused by invasion of the skin by larvæ of muscidæ and estridæ. The ova of the former are usually deposited in open wounds and ulcers, the latter in the puncture made by the insect, most frequently on exposed parts. The presence of the ova causes a local inflammation with suppuration resembling a boil. The embryos are found in the pus.

The lesions should be incised and thoroughly washed out with a solution of carbolic acid (1 to 40).

LARVA MIGRANS (CREEPING ERUPTION).

A disease caused by a parasite resembling the larva of a fly, 1 mm. in length, with ten segments, and hooklets with, at the head-end, apparently, two suckers, probably the larva of the botfly, or œstrus, of the genus Gastrophilus, of the species hemorrhoidal (Sokolow).

The burrow made by the parasite is $\frac{1}{8}$ to $\frac{1}{6}$ inch in diameter, just perceptibly raised, and of a pale rose-pink or reddish color. The burrow previously formed tends to break up into beak-like linear vesicles or disappears after the formation of thin crusts. The parasite travels at the rate of a fraction of an inch to 1 or more inches daily. It may take a tortuous, irregular, or erratic course, persisting indefinitely in its migration until a considerable portion of the cutaneous surface is transversed. There is usually but one animal present, at times two and exceptionally more. The parasite burrows in the epidermis. By pressing the blood out

of the part with a flat glass the parasite may be seen as a black dot. The malady has been most frequently found in Southern Russia and is rare in this country. I have seen several cases, in one both buttocks and the vulva were attacked, and in another the lower leg. The areas usually involved are the hands, the face, the feet, the lower portion of the legs, the forearms, and the buttocks. Some cases have developed during a sea voyage or at the seashore.

The treatment consists of excision of a small piece of skin at the site of the larva (the minute black dot), of cauterization with nitric acid, chloroform, or carbon dioxide snow.

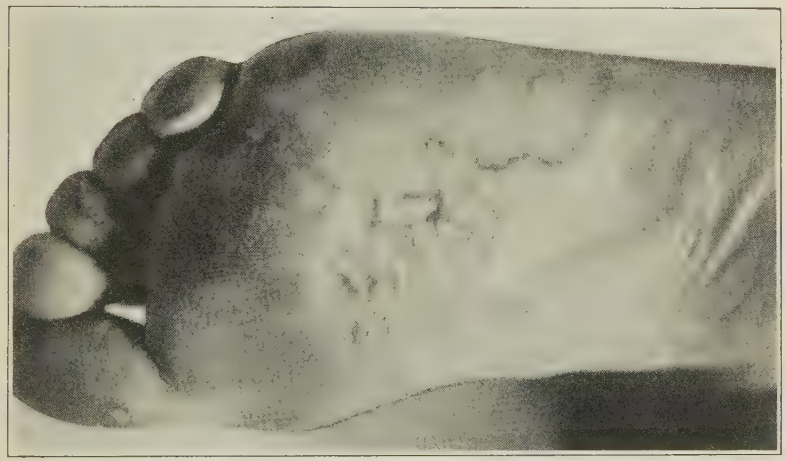


Fig. 193.—Larva migrans. (Courtesy of Dr. Abram Strauss.)

CRAW-CRAW.

The disease occurs chiefly on the West Coast of Africa and resembles somewhat scabies. It attacks mostly the fingers and forearms. The lesions consist of papules, vesicles and bullæ, but there are no perceptible burrows. The itching is intense and scratching may result in excoriations and crusts. Nematodes and filaria have been found in the lesions, in the fluid from these, and in scrapings. The disease is rebellious to treatment. Curetting of the underlying soft tissues may be required in addition to the parasiticides, advocated in scabies, and thorough cleanliness.

DRACUNCULUS (GUINEA WORM).

This parasite nematode worm is found in tropical countries—Guinea, Senegal, the West Coast of Africa, upper Egypt, Persia, India, etc. The female, which invades the skin, may be from

one to several feet in length and $\frac{1}{15}$ to $\frac{1}{10}$ inch in thickness. It is somewhat flattened and has a convex head, a curved and pointed tail, and is of a milky color. The embryo which enters the water is ingested by a minute crustacean (cyclops), undergoes a larval stage, and gains access to man through drinking-water. The female larva migrates into the tissues, and after reaching full development makes its appearance near the surface, along which it may travel, finally breaking through the epidermis. It may be felt as a cord-like mass under the skin. The first sign is usually a local inflammation which is of a vesico-pustular, nodular, or boil-like formation, accompanied by pain and swelling. The lesion breaks and at the bottom of the cavity the head of the worm is found. The worm and its contained young gradually, if undisturbed, are extruded from this opening. The worm is usually found on the foot, the thigh, occasionally on the hands and elsewhere. There is most frequently but one worm present, exceptionally two or more. The life of the Guinea worm in the human body is from nine months to a year.

Treatment.—Treatment consists of injecting into the forming tumor, the head or body of the worm, a solution of corrosive sublimate 1 to 1000 (Emily). Horton has suggested the internal administration of moderate or large doses of asafœtida.

CYSTICERCUS CELLULOSÆ CUTIS.

An affection caused by the cysticercus of Tænia solium. Infection of the integument occurs in about 5 per cent of the cases attacked. It is most frequently found in North Germany where pork, which is raw or only half cooked, is a favorite article of diet. The disease is characterized by a large pea- to walnut-sized tumor upon the skin. There may be few or many tumors, which are painless or somewhat painful, rounded or oval, smooth, elastic, firm, and usually freely movable. After reaching a certain development they may remain stationary, although after the death of the parasite they become smaller and tend to undergo calcification. The trunk or extremities are usually attacked. The diagnosis is frequently difficult, the finding of hooklets in the evacuated fluid, by means of puncture, is often essential in diagnosing the condition. The tumors should be excised.

ECHINOCOCCUS CUTIS.

The echinococcus larva, while usually attacking the internal organs, exceptionally gives rise to a soft, fluctuating, semitranslucent, projecting tumor of the skin, somewhat larger than that caused by the cysticercus. It is situated in the subcutaneous

tissue and is apt to attack women. The parasite becomes encapsulated, it dies in from one to two years' time, and the tumor becomes calcified. There are practically no subjective symptoms. The lesions should be excised.

DISTOMA HEPATICUM CUTIS.

Liver-fluke has, according to Küceumeister, been found, very rarely in the subcutaneous tissue of human beings, either upon the ear, the lower extremity, or the trunk. There is a tumor-like formation present, which may be painless or slightly painful. The finding of the distoma alone proves the diagnosis. Extirpation should be carried out.

Bilharzia hematobia ova has been found by Sharkey in specimens of skin sent him from Cairo.

UNCINARIASIS OF THE SKIN (GROUND ITCH).

This affection is characterized by an erythematous, erythemato-papular, and papulo-vesicular eruption of the feet due to the irritation of these parts by the larvæ of the hookworm. Probably several varieties of the intestinal parasite (uncinaria duodenalis, ankylostoma duodenalis, etc.) may invade the skin. Those going barefooted in moist or wet, muddy, and sandy soil are particularly liable to invasion. The affection is intensely itchy and secondary pus infection may result from scratching; rarely obstinate ulcerations or gangrene develops. The cutaneous outbreak frequently lasts for several weeks or longer.

Treatment.—Treatment consists in cleanliness, and the prolonged soaking of the affected parts in a boric acid or weak corrosive sublimate solution. As a measure of protection individuals should not go barefooted in the warm rainy season of the tropics.

TRYPANOSOMIASIS (SLEEPING SICKNESS).

In the advanced stages of "sleeping sickness," which is caused by the invasion of the body by a minute flagellate parasite through the intermediary of a certain insect, there may be an outbreak of itchy vesico-papular, urticaria-like, and erythematous lesions which assume ring-like patches. In addition, there may be a variable amount of irritation at the points of cutaneous puncture made by the insect, through which the trypanosome enters the body. Later at these points of irritation there may develop red or violet-colored furuncle-like elevated swellings, which usually disappear in a few days leaving pigmented spots. In the cases with inflammatory symptoms and edema there is considerable constitutional disturbance, with lymphangitis and adenitis. The posterior surface of

the neck, the limbs, the knees, the flanks, and axillary regions are usually attacked. The reader is referred to books on general or tropical medicine for the details of the disease and its treatment.

BELOSTOMA.

Belostoma ("electric light bug"), according to Schafer, produces irritating effects by its sting. It has a dagger-like prolabium with which it does the damage.

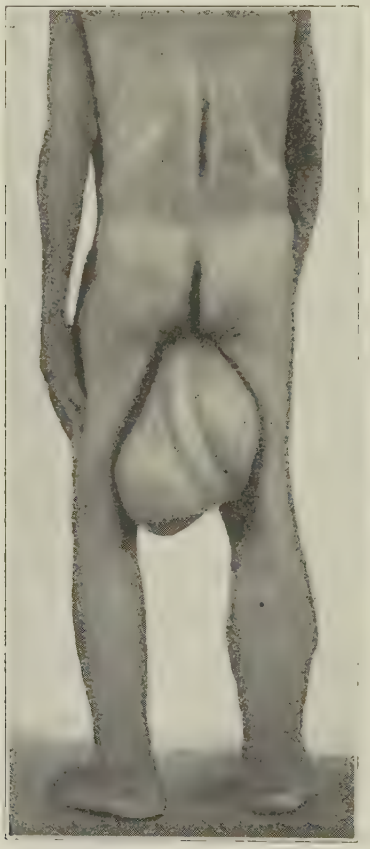


FIG. 194.—Filarial elephantiasis. (Courtesy of Dr. E. B. Vedder.)

FILARIAL ELEPHANTIASIS.[1]

This condition, attacking usually the legs, the penis, the scrotum, and the clitoris, may be unilaterally or bilaterally distributed.

[1] See synonyms under Elephantiasis.

The affected part is enormously enlarged, the skin thickened and adherent to the underlying structure. The skin may be smooth, or a brownish or purple color, hide-like, or of a roughened, warty appearance, and with numerous lymphangiectases with exuding lymph. Ulcerations with foul, sanious discharges may develop. The condition begins insidiously or is preceded and accompanied by severe rigors, prostration, delirium, and fever. It may also supervene upon one or more attacks of erysipelas. There may, at various times, after the development of the skin manifestations, be attacks of fever.

In the form known as *lymph scrotum* the lymphatics are varicose and when ruptured a pinkish or milky lymph exudes. Hematuria or chyluria may be an associated condition.

Fig. 195.—Filarial elephantiasis. (Courtesy of Dr. E. B. Vedder.)

There is some doubt as to whether the lymphatic obstruction is due to the parasite directly or by its indirect action is predisposing to an inflammation of the lymph channels of bacterial origin.

The cause of the infection is the *filaria sanguinis hominis,* three different species of which, *filaria sanguinis hominis diurna, nocturna* and *perstans,* have been found in the human blood. The intermediate host of the filaria is the mosquito. The condition is endemic in tropical countries and occurs sporadically in the United States.

Pathology.—The changes are the same as those described under Elephantiasis of non-filarial causation.

Diagnosis and Prognosis.—The finding of the filaria in the blood with the clinical appearance of elephantiasis clearly differentiates the condition.

Treatment.—Prophylaxis consists in elimination of the mosquito and the administration of quinine to the individual. Surgical interference is required.

CLASS 11.

DISEASES OF THE APPENDAGES.

A. DISEASES OF THE SWEAT GLANDS.

HYPERIDROSIS.

Definition.—An affection characterized by an increased production of sweat, of local or general distribution, slight or marked, either acute or chronic in course.

Symptoms.—Generalized sweating to an exaggerated degree is an idiosyncrasy of otherwise normal individuals, and therefore is present through the life of the individual, or may develop secondary to certain diseases, and is usually most marked in the axillæ, the genito-crural regions, the hands and the feet. The slightest exertion greatly increases the tendency, and in addition to being profuse during the summer, it is also marked in cold weather. Because of the amount of excretion and the chemical changes which the sweat may undergo, the individual is prone in warm weather to outbreaks of eczema, to boil formation, prickly-heat, and intertrigo (chafing). In rare instances sweating may be limited to localized areas or of a unilateral distribution. Unilateral sweating of the face occasionally occurs.

Sweating is frequently limited to the hands or feet alone, or both may show the anomaly. The condition limited to both hands is rather frequent, and is most marked on the palms and the palmar surface of the fingers. The sweating may be persistent or be excited by nervousness or excitement. It may exist in a mild degree or the excretion may be so copious that the sweat accumulates in drops and drips from the fingers. Gloves will frequently become saturated in a few hours' wear. Occasionally there will be deep-seated vesicles (*pompholyx*) associated with the sweating and a horny or wart-like thickening.

Severe or a mild degree of sweating is of quite frequent occurrence upon the feet, almost entirely limited to the soles and the plantar surface of the toes. The feet are constantly damp or wet, the socks or stockings moist or drenched a short time after they are put on, and in severe instances the shoe becomes water-soaked. In the cases with marked sweating the skin is macerated, soggy, pinkish red or violet in color, puffy, and irritated. In addition

there may be deep-seated vesicles in the affected areas, and, at the edge, abrasions and some vesicle formations.

Excessive sweating may be more or less limited to the axillary and genito-crural regions. There is very often a disagreeable odor associated with the hypersecretion of sweat, particularly of the feet (*bromidrosis*).

Etiology and Pathology.—Excessive general sweating is generally associated with debility and is a symptom of some underlying disease, such as incipient Graves' disease, tuberculosis, malaria, nervous influences, hereditary tendencies, and following convalescence from prolonged and debilitating conditions such as influenza. Idiosyncrasy is the unsatisfactory explanation of some of the localized cases, although flat-foot, malpositions of the feet and nerve irritation, central or truncal, have been cited as causal. Certain articles of diet have apparently been causal. The sweat does not differ from that normally secreted.

Prognosis.—The result depends chiefly upon the eradication of the underlying cause.

Treatment.—In addition to the treatment of the underlying condition, the remedies usually administered are ergot, belladonna, gallic acid, the mineral acids, quinine in full doses, and, if the health is below par, tonics. Tincture of belladonna in 5- to 7-minim (0.3 to 0.5) doses three or four times daily; or atropine sulphate, $\frac{1}{200}$ to $\frac{1}{100}$ gr. (0.0003 to 0.0006), after each meal, and possibly an additional dose at bedtime, are the most dependable.

The three local preparations I have found most efficient are a dusting powder containing salicylic acid, 10 gr. (0.65); boric acid, 1 dr. (4.); powdered talcum, 7 dr. (28.); a solution of formalin, 1 to 2 dr. (4. to 8.) to the pint (480.) of water; and salicylic acid and resorcin, each $\frac{1}{2}$ to 1 dr. (2. to 4.) to the fluidounce (30.) of alcohol. In treating the somewhat generalized cases, the dusting powder alone, or in addition the thorough mopping on the surface of alcohol; in those in whom the axillæ and the genito-crural regions are particularly involved, either the dusting powder or the formalin solution. For the hand cases either of the three. The most efficient preparation for hyperidrosis of the feet is the salicylic acid-resorcin-alcohol preparation just mentioned, devised by Dr. C. N. Davis. This compound is thoroughly painted on the soles of the feet and the plantar surface of the toes night and morning. After five days' to a week's painting the epidermis starts to peel, and the application is then stopped. After the peeling process on the feet is completed, in the majority of the cases the sweating is stopped for some days, weeks, and even longer. The procedure can again be repeated if the condition relapses. In addition the patient should thoroughly bathe the feet night and morning

in warm water and with a mild soap. Socks or stockings with white feet should be worn, a fresh pair each day, and plenty of the powder mentioned above dusted into these articles. The resorcin and salicylic acid solution is not so efficient on the hands and should be used ½ dr. (2.) each to the ounce (30.), while double that strength may be employed on the feet. The epidermis before the peeling process starts is stained a brownish-red. The roentgen-ray may be employed in localized sweating.

BROMIDROSIS.

Definition.—Sweaty secretion having an offensive odor.

Symptoms.—While in the great majority of cases bromidrosis is associated with increased secretion of sweat (*hyperidrosis*), it may occur independently. The normal secretion of sweat in some individuals, even if normal in quantity, possesses a heavy, disagreeable odor. In those cases in which there is an oversecretion of sweat the symptoms are the same as in hyperidrosis plus the extremely disagreeable odor.

Etiology and Pathology.—The same factors enter into its production as in the preceding disease. In addition, however, the ingestion of certain drugs gives rise to peculiar odors, such as asafœtida, sulphur, cacodylate of soda, garlic, musk, copaiba, benzoic acid, etc. Various diseases also exhale peculiar odors in the sweat—smallpox, cholera, typhoid, etc. It is believed that the odor is due to some chemical change in the sweat after secretion. Probably in a considerable number of cases the decomposition of the fatty acids in the sweat and in addition the development of large numbers of bacteria—*bacteria fetidum*—are the cause of the fetor.

Treatment.—The treatment is the same as has been suggested under hyperidrosis.

ANIDROSIS.

Definition.—Diminution or suppression of sweat secretion.

Symptoms.—Instances of the affection have followed nerve injuries, and diminished or temporarily suppressed secretion as a symptom of the graver nervous maladies. It also occurs in varying degree, in various diseases such as ichthyosis, some cases of eczema, pityriasis rubra pilaris, anesthetic leprosy, scleroderma, keloidal growths, etc. In certain individuals the skin is normally dry, the sweat glands being somewhat inactive, the skin tending to itch, to crack, and to attacks of eczema, particularly during the cold weather.

Treatment.—The underlying condition if ascertainable should be treated. Plenty of water should be ingested and frequently the administration of pilocarpine hydrochlorate, $\frac{1}{4}\frac{1}{0}$ to $\frac{1}{5}\frac{1}{0}$ gr. (0.0016

to 0.0012) three or four times daily is helpful. Locally thin salves or oily preparations should be rubbed in once or twice daily. The following ointment is useful for the dry skin: Salicylic acid, 10 gr. (0.65); lanolin, 2 dr. (8.); petrolatum, 6 dr. (24.).

CHROMIDROSIS.

Definition.—A disease characterized by the secretion of colored sweat.

Symptoms. Foot collected 38 cases of this affection; the sweat secretion was black, blackish, or brownish in 21; blue, bluish-black, bluish-brown, or violet in 15; and yellowish-brown in 2. A red color has been observed in a few instances. The usual sites of attack are about the eyelids, especially the lower, the forehead, and cheek. Less often the breast, the neck, the back, the hands, the axillæ, the groins, and genito-crural regions are involved. The affected part becomes discolored by the gradual collection of the secretion. It has the appearance of a discolored, oily seborrhea, rather than sweat. It is flaky and granular. Although the affection is usually localized, J. C. White recorded an instance in which it was unilaterally distributed on half of the trunk. In rare instances the color has changed, and the discoloration has disappeared in one part to reappear in another.

Etiology.—The disease is extremely rare, occurring usually in nervous or neurasthenic women between sixteen and fifty years of age. Uterine disturbances, constipation, and residence near the sea have been suggested as predisposing or causal. The ingestion of certain drugs has rarely given rise to the effect; thus, green sweat has been caused by copper; pink by potassium iodide; and blue presumably by an iron compound.

Although the pathology of the affection is still somewhat doubtful, it has been thought to be a functional disorder of the sweat glands, rarely the sebaceous glands. The color has been attributed to chemical changes found in the indican in these secretions (Hoffmann, Bizzio). A pigmentary anomaly has also been suggested (Heidingsfeld).

Prognosis.—Recovery is to be expected, although the condition may last over a considerable time, relapses being frequent.

Treatment.—The underlying condition should be treated. Locally an ointment containing boric acid, ½ dr. (2.); salicylic acid, 10 gr. (0.65); petrolatum, 1 oz. (30.), may prove of use.

RED CHROMIDROSIS (PSEUDOCHROMIDROSIS).

The sweat in these cases is free from color, but subsequently becomes stained by microörganisms. The axillæ and the genito-

crural regions are the sites of predilection, in fact, any moist, warm, hairy region. Hartzell and others have discovered that the orange or red color is due to chromatogenous bacteria which are attached to the hairs in agglutinated masses—zoöglea—and also in scrapings of the epidermis and in the discolored linen. It is probable that the change in the character of the secretion from some unknown cause affords an unusual opportunity for the growth of these organisms. According to Crocker, red sweat is associated with leptothrix.

The disease is eradicated by the application of a solution of corrosive sublimate (1 to 1000 or 1 to 2000).

HEMATIDROSIS.

Bloody sweat is of extremely rare occurrence. Any portion of the integument may be attacked and several points simultaneously. The affection may start on the normal-appearing skin or be preceded by slight elevation of the cutaneous covering. There may also, apparently, be a vesicle, bleb, or erythema-like formation. The condition is usually observed in nervous, hysterical women during intense emotional excitement, or associated with faulty or vicarious menstruation. There may be a preceding neuralgia or hyperesthesia of the part. The small quantity of blood exudes from the sweat pores. *Treatment* is directed toward the underlying cause.

URIDROSIS.

A rare condition characterized by the secretion of sweat containing the elements of urine, particularly an abnormal amount of urea. It appears on the skin as a whitish coating, resembling flour. It is usually observed upon the hands and face. Microscopical examination of this secretion shows crystalline or irregular powdery masses. It is usually observed in connection with renal disease, in which there is partial or complete suppression of the urine. It has been observed in association with cholera. The administration of jaborandi, in certain instances, has tended toward its excretion. *Treatment* is directed to the underlying cause.

PHOSPHORIDROSIS.

In very rare instances phosphorescent sweat has been observed, particularly in the later stages of phthisis, malaria, or after eating putrid fish. The phosphorescence is probably due to photogenic bacilli. *Treatment* consists in eradicating the underlying cause.

SUDAMEN.

Definition.—An outbreak consisting of small non-inflammatory superficial vesicles containing sweat.

Symptoms.—The eruption appears suddenly upon any portion of the cutaneous surface, but usually on the chest and neck, and consists of numerous minute, whitish or pearl-colored vesicles with clear contents, which are discrete, although, at times, closely grouped. The minute lesions develop on the normal-hued skin, dry up and disappear without leaving a trace. There are no symptoms.

Etiology.—The eruption is common in the acute fevers, particularly acute rheumatism, enteric fever, in the crisis of pneumonia, in those gravely debilitated, and is probably due indirectly to nerve disturbance.

Pathology.—Histologically the vesicles are located in the horny layer of the epidermis, and the ducts of the sweat glands open into them.

Diagnosis.—The lesions of hydrocystoma are larger, more deeply seated, located on the face, and do not accompany febrile or cachectic conditions. Miliaria is distinguished by its inflammatory character.

Prognosis and Treatment.—The affection usually lasts but a few days, but there may be the appearance of new lesions for a longer period. Treatment is usually not required, but alcohol and water, equal parts, with boric acid, 15 gr. (1.) to each ounce (30.), may dry up the lesions more rapidly.

HYDROCYSTOMA.

Definition.—A non-inflammatory disease of the face characterized by discrete, pin-head to pea-sized, shiny, translucent, deep-seated, persistent vesicles.

Symptoms.—The eruption may consist of a few to a hundred rounded or ovoid whitish or light-yellowish lesions which have a somewhat thick covering and do not tend to rupture spontaneously, and resemble somewhat boiled sago grains. The outbreak exceptionally may be limited to a small portion of the face, such as the nose, or to one cheek. Rarely there may be one-sided sweating of the face in a unilateral case or of the whole face in bilateral instances.

The lesions are more or less persistent, lasting for weeks or months, the contents always clear and non-purulent, and are finally absorbed, disappearing without trace. There are no inflammatory symptoms.

Etiology and Pathology.—The disease in almost all instances has developed in middle-aged or older women, especially those whose faces are exposed to a warm, moist atmosphere, as washerwomen. Those who perspire freely are more apt to be attacked. There is the suggestion of a neurotic factor in some of the cases.

Histologically the lesion is a cyst-like formation of the duct of the sweat gland, located in the beginning in the lower portion of the corium, and later encroaching upon the epidermis. The wall of the

FIG. 196.—Hydrocystoma. (Jackson.)

cyst is lined with two or more layers of epithelial cells, which originate from the normal epithelium of the duct. The cyst contains sweat of an acid reaction.

Diagnosis.—The sex and age of the patient, the location on the face, the whitish or yellowish-white color, the size and its persistence distinguish the affection from the chamois-skin lesions of xanthelasma, and from the minute vesicles of sudamina.

Treatment.—If the lesions are not too numerous the electric needle or trichloracetic acid eradicates the condition.

GRANULOSIS RUBRA NASI.

This rare affection is usually limited to the front and sides of the nose, exceptionally, in addition, the upper lip, the cheek, or the eyebrow has been attacked. The involved area is of a bright red color, diminishing in intensity toward the sides of the nose, and the hue fades into that of the sound skin. There are irregularly distributed over the patch pin-point- to pin-head-sized deep red or brownish-red specks and papules, which disappear temporarily under pressure. There is an associated sweating (hyperidrosis) of the affected area, and, at times, elsewhere: the sweat often standing out in scattered droplets.

It occurs in delicate children of the male sex chiefly, and runs a chronic course. Hyperidrosis seems to be predisposing at least. It has exceptionally been associated with hydrocystoma.

Lupus vulgaris is eliminated by the histological findings, the persistence of the yellowish color of the nodules under pressure, and the positive tuberculin test. Histologically there is a considerable difference of opinion as to whether there is a perivascular disturbance of an inflammatory type in the corium or a chronic inflammation originating in the vessels around the sweat apparatus. The disease is extremely resistant to therapeutic measures. Linear scarification has been recommended.

MILIARIA (PRICKLY HEAT).

Synonyms.—Lichen tropicus; Heat rash; Red gum; Strophulus.

Definition.—An itching papular and minute vesicular eruption which appears at the orifices of the sweat glands.

Symptoms.—Although the outbreak may consist entirely of papular lesions or those of the vesicular type, in most instances both varieties are present, one type predominating. Some of the lesions may be the combination of the two—vesico-papules. The outbreak occurs suddenly, and is usually of a rather extensive distribution but at times limited to a comparatively small area. The papules are mostly small pin-head in size and rarely larger than a millet seed, of a pinkish or bright red color, and although discrete, are so closely crowded together that the affected area is somewhat inflamed. The vesicles are pin-point to small pin-head in size, of an acuminate or conical shape, never coalescing and not tending to rupture. The lesions are surrounded by a slight pinkish or reddish areola, and because of their close approximation the area attacked has a red and inflammatory appearance—*miliaria rubra*. The areola may fade, and the contents become opaque and yellowish-

white instead of transparent (*miliaria alba*). Exceptionally the contents of the vesicles become seropurulent or purulent.

Miliaria is accompanied by a burning, pricking, or itching sensation, either slight or quite severe. The affection usually runs a course of one to two weeks, the papules fading away and the vesicles drying up into minute crusts, which fall off. Because of the scratching and rubbing, eczematous areas, secondary pustular eruptions, impetigo, and boils are apt to result.

Etiology and Pathology.—Summer heat, working in an overheated room, vapor baths, or too thick clothing are productive of outbreaks. Those who perspire freely, particularly infants, children, and obese adults, are prone to attacks. Violent exercise or excessive drinking of alcoholic beverages and hot drinks may produce an attack or recurrence.

The affection is due to sweat obstruction, with mildly inflammatory symptoms which precede or develop secondarily. There is congestion and exudation, and in certain instances sweat effusion about the ducts, leading, according to its intensity, either to a papular or vesicular formation.

Diagnosis.—The warm weather or overheating and the character of the outbreak distinguish it from the larger lesions of papular eczema and the absence of oozing from vesicular eczema.

Prognosis and Treatment.—The disease runs a short course, but tends to relapse if the cause is not removed.

Extreme cleanliness is indicated as a preventive measure; also moderate rather than violent exercise; sufficient rather than an over amount of clothing—thick woolen materials are particularly bad—and the elimination of hot drinks and alcoholic beverages during the summer months. Lotions and dusting powders are agreeable and soothing. The two following are particularly efficacious:

℞.—Thymolis		gr. ij	0 | 12
Camphoræ		gr. xl	2 | 6
Phenolis		gr. xx	1 | 3
M. et adde:			
Acidi borici		ʒiss	6 | 0
Bismuthi subcarbonatis		ʒij	8 | 0
Pulv. talci	q. s. ad	ʒiv	120 | 0
M. Sig.—Apply freely.			

or

℞.—Phenolis		ℳxlv	3 | 0
Acidi borici		ʒiss	6 | 0
Pulv. zinci oxidi		ʒiij	12 | 0
Glycerini		f ʒj	4 | 0
Aquæ camphoræ	q. s. ad	f ʒvj	180 | 0

Apply freely several times daily. If there is an added boil formation, ichthyol, 1 dr. (4.) to the fluidounce (30.) is placed in the last preparation, omitting the phenol.

Miliary Fever (*sweating sickness*) is an acute eruptive fever which occurs in epidemics, none having been reported since 1887. The affection starts suddenly with excessive sweating, headache, furred tongue, and fever. Two or three days after the start of these symptoms an eruption develops, consisting of papules upon erythematous areas. The papules become vesicular and the lesions are those found in miliaria. The lesions may attack a large portion of the cutaneous surface, including the buccal mucous membranes. Subsequently desquamation occurs.

B. DISEASES OF THE SEBACEOUS GLANDS.

SEBORRHEA.

Definition.—A functional disease of the sebaceous glands characterized by an oversecretion of fatty material, which forms an oily coating or scale. Two forms of the affection are recognized, an oily variety, *seborrhea oleosa*, and a dry type, *seborrhea sicca*.

Seborrhea Oleosa.—This variety usually attacks the scalp and the face conjointly, although it is frequently more marked in one location than the other, depending upon the case. The hair is oily and greasy, looks moist, sometimes glistening, and is often slightly sticky, and in women the hairs may be somewhat matted together. This condition may be marked or only slight. There are no inflammatory symptoms present. Thin scales of a dirty gray color may form. There is a tendency to hair loss in long-standing cases.

The favorite site of attack on the face is the nose and contiguous parts, although the forehead and less often other portions of the visage may be involved. The skin is shiny and glistening, oily to the touch, and in marked instances small oil globules are seen. The integument may be pale and unhealthy looking and the mouths of the gland ducts widely open. The nose in other instances is somewhat congested and of a sluggish red hue. In addition, not infrequently, acne lesions and blackheads are present. In women there is a tendency to superfluous hair formation.

Seborrhea Sicca.—This condition is present more or less generally in infants at birth, and is known as the so-called *vernix caseosa*. Although this covering disappears from the body, it not infrequently remains caked upon the scalp for some months after birth, and the area is prone to eczematous outbreaks. Seborrhea sicca both in children and adults is usually observed upon the scalp (*seborrhea capitis* or *dandruff*). The oversecretion of fat mixed with the exfoliating epidermic scales gives rise to an irregular, thin or thick, soft, greasy-looking or wax-like, gray or brownish

covering, involving portions of the entire scalp, most marked usually, however, at the vertex. The hairs are frequently dry, lifeless in appearance, without gloss, and unhealthy in aspect. There is usually considerable hair fall, and baldness may eventually develop.

The nose, the hairy portions of the face, the sternal and interscapular regions may be involved, but in most instances in which these areas are attacked there is an inflammatory element present, and they are then classed under *seborrheic dermatitis.*

The seborrheic condition has been observed upon the glans and corona of the penis, beneath the prepuce, in the pubic region, and in women, about the clitoris and vulvar folds. Itching may be mild or severe.

Fig. 197.—Seborrhea (dandruff). (Courtesy of Dr. Sequeira.)

Etiology.—Exclusive of the seborrhea of the newborn, the affection in most instances is observed between fifteen and thirty years. It is exceedingly common, and several factors have been considered as predisposing, such as general debility, anemia, chlorosis, dyspepsia following severe constitutional diseases, scrofulosis, and loss of tone in the glands and the skin. Both Unna and Sabouraud claim that the condition is due to a microbacillus.

There are two essential conditions present—an overproduction of normal sebum and a dilatation of the sebaceous gland-duct openings.

Diagnosis.—The greasy or dry scale formation or the oily condition of the skin without signs of inflammation readily distinguishes the condition from all others.

Prognosis and Treatment.—Seborrhea can be eradicated, but tends to relapse.

In the treatment of the *oily seborrhea* of the face several prescriptions are efficient, lotions being preferable. Treatment should be started with a mixture consisting of boric acid, 1 dr. (4.) to 4 fl. oz. (120.) of alcohol. If the result is not such as is desired, 5 or 10 gr. (0.32 to 0.65) of resorcin may be added to each fluidounce (30.). In the event of failure a lotion consisting of the sulphate of zinc and sulphuret of potash, each 5 to 15 gr. (0.32 to 1.) to the fluidounce (30.) of water or witch-hazel, should be used. The latter is frequently made more efficient by the addition of 1 or 2 fl. dr. (4. or 8.) of alcohol to each fluidounce (30.). In severe instances liquor adrenalin chloride (1 to 1000), 15 minims (1.) to the fluidounce (30.) of either mixture may prove helpful. The lotions should be applied twice daily.

In the treatment of the seborrhea of the infant's scalp as efficient a preparation as any consists of ammoniated mercury, 20 gr. (1.3); salicylic acid, 10 gr. (0.65); lanolin, 2 dr. (8.); petrolatum, 6 dr. (24.). This is gently but thoroughly rubbed in twice daily.

In marked cases of seborrhea of the scalp in which there is a considerable amount of scale formation the drugs which are most efficient are liquor carbonis detergens, sulphur, resorcin, and salicylic acid. The following ointment is extremely useful in cases with thick scales on the scalp: Liquor carbonis detergens, 1 to 1½ fl. dr. (4. to 6.); salicylic acid, 10 to 20 gr. (0.65 to 1.3); lanolin, 2 dr. (8.); either cold cream or petrolatum 6 dr. (24.). Another prescription almost equally efficient contains: Precipitated sulphur 1 dr. (4.); salicylic acid, 20 gr. (1.3); lanolin, 3 dr. (12.); petrolatum, 4 dr. (15.). A lotion with the following formula has the desired effect of loosening the scales: Resorcin, 20 gr. (1.3); salicylic acid, 10 gr. (0.65); castor oil, 2 minims (0.1); alcohol, 6 fl. dr. (24.); camphor-water, 2 fl. dr. (8.).

The ointments are to be recommended in severe instances of this affection, which attacks the scalp, but they are rather difficult to use in women because of the long hair. The ointment base devised by C. N. Davis, and termed unguentum steroglycerid (see Section on external treatment for formula), can be used very nicely in long-haired individuals or by men who object to a greasy base. When this base is used the salicylate of soda, 20 to 40 gr. (1.3 to 2.6) to the ounce (30.), is substituted for the salicylic acid. The lotion suggested above is frequently a better preparation to use for women's scalps than even the unguentum steroglycerid. If the scalp is

unusually oily the camphor-water and the castor oil are both omitted from this lotion and alcohol alone is used as a base. If the seborrhea is moderate rather than marked, a lotion containing salicylic acid, 10 gr. (0.65); corrosive sublimate, $\frac{1}{2}$ gr. (0.03); castor oil, 2 minims, (0.1); alcohol, 6 fl. dr. (24.); witch-hazel, 2 fl. dr. (4.), is efficient. If the dandruff is mild in amount and the itching is fairly severe the corrosive sublimate is omitted from the last prescription and phenol, $7\frac{1}{2}$ gr. (0.5) to the fluidounce (30.) is substituted. If the scalp hairs are unusually dry the quantity of castor oil may be increased. Several safeguards are necessary in prescribing these preparations; resorcin is apt to make blond or white hair a reddish-brown tinge if used over too long a period, particularly during the summer months, and therefore its use should be restricted to winter, and for a period not exceeding two to three weeks. It may also cause irritation in susceptible individuals. Its efficiency, however, in some of the severe instances of this affection is such that it should be used, but with care. Liquor carbonis detergens also should be used for but a short period in light or white-haired individuals for fear of darkening the hair. In using an ointment the hair should be parted and a small quantity of the preparation rubbed thoroughly into the skin; the partings are continued until the entire scalp has been thoroughly anointed. Lotions should be applied by means of an eye dropper or a sprinkler cork on the bottle; and a few drops are applied on various portions until the scalp is covered. As the lotions usually are quite strong, they should be allowed to dry and the scalp then thoroughly rubbed with the finger tips, or rubber gloves may be worn while massaging the moist scalp, or a stiff brush may be used to rub the lotion in before it has dried. If the hairs are abnormally dry the scalp should not be washed more frequently than every three weeks; if quite oily, once each week or ten days may be required. A mild soap and plenty of warm water are advocated for the washing process. After the seborrhea of the scalp has been eradicated one of the lotions mentioned should be used routinely once or twice each week to prevent a relapse of the condition.

SEBACEOUS CYST.

Synonyms.—Steatoma; Atheroma; Wen.

Definition.—A soft or firm, painless tumor, which is located in the skin or subcutaneous tissue, of a variable size and shape.

Symptoms.—Sebaceous cysts are in most instances of slow growth, and after they become of pea, walnut, or larger size, they remain stationary. The skin covering the growth is usually normal in color, but at times somewhat whitened; exceptionally the orifice

of a sebaceous gland duct can be seen on the surface. The tumor is rounded or semiglobular, elevated, painless, and either soft or firm, and there is usually but one present. The usual sites of attack are the scalp, the face, the back, and the scrotum. *Chalazion* is a similar but smaller growth connected with the Meibomian glands. There are no accompanying symptoms in the average case. Exceptionally in the large growths the skin may become irritated, inflamed, and reddened, suppuration and ulceration result, and in rare instances in aged individuals malignant change may occur. The hair is lost over the growth on hairy parts.

Etiology and Pathology.—The cause of the affection is unknown. The growth consists of a capsule, composed of fibrous connective tissue, and within this envelope is a hard and friable, or cheesy and soft, sometimes fluid, whitish or yellowish mass, often having a fetid odor. The composition of this mass is sebum, epidermic cells, cholesterin crystals, detritus, and occasionally lime salts.

Diagnosis.—Its chronic course, the single lesions and non-inflammatory character distinguish it from a lobulated fatty tumor, gumma and fibroma.

Prognosis and Treatment.—The growth tends to remain indefinitely. Treatment is exclusively by surgical means, although the electric needle has been used successfully in some cases. A linear incision is made over the growth, the mass is enucleated, and the capsule destroyed.

ASTEATOSIS.

This is the term applied to the condition in which there is a diminution in the amount of sebum secreted by the sebaceous glands of the skin. It is hardly a separate disease, as it occurs in association with or following certain cutaneous diseases, such as ichthyosis, prurigo, pityriasis rubra pilaris, scleroderma, dermatitis exfoliativa, chronic scaly eczema in old age. Locally it may follow the continued use of strong alkali and soda soap. Certain individuals have normally a dry, harsh skin, due to the absence of sufficient secretion of the sebaceous glands and sweat glands.

Treatment.—If there is an underlying cause it should be removed. The use of strong soaps should be eliminated, and the water used should be softened by the use of bran. An ointment containing salicylic acid, 8 gr. (0.5); lanolin, 2 dr. (8.); petrolatum, 6 dr. (24.), is frequently indicated.

MILIUM.

Definition.—A small pearly-white sebaceous tumor.

Symptoms.—Milia are millet-seed, pea, or smaller in size, chiefly situated upon the face, most often upon the forehead, near the orbit,

and the cheeks. They are translucent, spherical in shape, superficial, and after reaching a certain size, remain stationary for years. There may be a few or many present. Rarely they may form into groups. In very rare instances one or more of the larger milia may undergo calcareous change (cutaneous calculi).

Etiology and Pathology.—The lesions are most frequently seen in the young and early adult life, especially in women, but infants are not infrequently attacked. They may be associated with acne and comedones (blackheads).

The tumor is situated just beneath the epidermis, which constitutes its external covering. The affection probably results from the retention of sebaceous matter in one or more acini of the sebaceous glands.

Diagnosis.—The disease is distinguished from the comedo (blackhead) by the absence of the opening of the sebaceous gland duct and the pearly white rather than the black color. Molluscum contagiosum is characterized by larger lesions and central umbilication.

Prognosis and Treatment.—Milia persist indefinitely, occasionally disappearing spontaneously in the infant.

The methods giving the most satisfactory result are either trichloracetic acid or the electric needle. A tooth-pick or pointed applicator is dipped in the acid and touched to the milium until the surface is whitened rather than a pearl white, and alcohol is then applied. The electric needle is fastened to the negative pole of the battery, a current of 2 ma. is used, and the center of the milium is pierced; the contact is maintained until the lesion becomes a dirty yellow.

COMEDO (BLACKHEAD).

Definition.—An affection characterized by the production of black points or papules formed by sebum and horny cells blocking the mouth of the sebaceous gland ducts.

Symptoms.—Blackheads are usually observed on the face, chiefly in the vicinity of the nose, the chin, and the sides of the forehead. There may be but a few or a large number present. The back and chest also in certain cases show the outbreak. The lesions are pin-point to pin-head in size, non-elevated, or slightly raised. At times a papule or pustule may develop at the site of the blackhead because of inflammation secondary to microbic invasion. Blackheads run a chronic course; occasionally the plugs loosen and fall out. Exceptionally comedones may occur in groups, of symmetrical distribution. Oily seborrhea and acne are frequently associated conditions.

Etiology.—Predisposing factors are digestive disorders, constipation, chlorosis, menstrual irregularity, lack of tone of the skin, combined with insufficient use of soap and working in dirt and dust. Workers in tar, paraffine, oils, and petroleum products are particularly apt to have an outbreak on the chest, abdomen, and back. Unna, Hodara, and Sabouraud have described a microbacillus which they consider causal. The small parasite *demodex folliculorum* (acarus folliculorum) of Henle and Simon is found in the sebaceous mass, but as it is found also in the normal follicles it has no influence on causation. Males are more frequently attacked than females, and exceptionally blackheads are observed in young children and even infants.

Pathology.—The thickening of the horny layer causes a blocking of the gland opening, which allows the secretion to collect and harden. The comedo plug is composed of epidermic cells and débris with sebaceous matter.

Diagnosis.—It is differentiated from milium by its central opening from which the contents can be squeezed and by the black color.

Prognosis and Treatment.—The lesions can be eradicated and the tendency for fresh outbreaks partially or entirely eliminated.

The internal treatment is the same as suggested under acne. Locally the plugs can be removed by lateral pressure with the fingers or by a special comedo extractor. Otherwise the treatment is the same as for acne, with which it is so commonly associated.

ACNE VULGARIS.

Definition.—A disease of the sebaceous glands, characterized by the development of papules, pustules, blackheads, and at times, sebaceous cysts, running a chronic course, and usually associated with digestive disturbances and constipation.

Symptoms.—The face is attacked, in most instances, either alone or in association with the shoulders and back, and less frequently the chest, or other portions of the cutaneous surface. The papules are either superficial or deep-seated, pin to pea in size, firm to the touch, and of a bright red to a sluggish dark red color. They may develop at the site of a blackhead. The summit of the papule in certain instances has a small pustular point. Pustules are also of either a superficial or deep-seated variety and from a pin-head to pea in size. The latter may be quite inflammatory and resemble a furuncle. Blackheads are also usually present either in profusion or but a few. In addition, pea- to hazel-nut sized sebaceous cysts, in most instances but one, two or a few, may be present; exceptionally there are a considerable number. The entire outbreak may consist of not more than a dozen papules or pustules, or the com-

bination of the two, but usually there is a considerable number present, and frequently the entire face is covered with lesions. The lesions tend to remain discrete, but in extensive cases they are closely crowded together. The superficial lesions disappear without leaving a trace, but those deeply seated, particularly pustules, cause scars. The skin may exhibit an oily seborrhea.

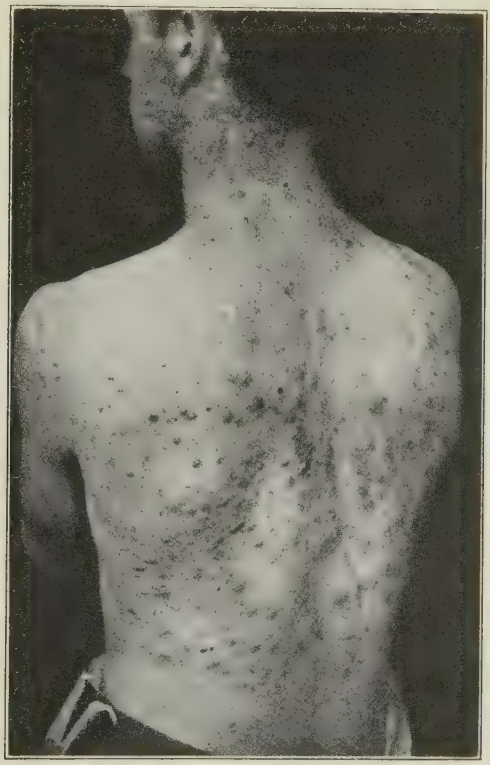


FIG. 198.—Acne keloid of the back. (Ormsby.)

Etiology.—Acne vulgaris usually develops between puberty and twenty-five years of age. It is frequently associated with digestive disturbances, constipation, menstrual irregularities, chlorosis, general debility, lack of tone in the muscular fibers of the skin, and scrofulosis. Lack of cleanliness, dust, and dirt seem to predispose to an outbreak. Certain drugs, particularly the bromine and iodine preparations, are prone to cause an attack. Laborers in tar and petroleum products frequently show a profuse eruption. The condition is usually much worse during the monthly menstrual period. A fresh outbreak not infrequently follows indiscretions in diet,

such as highly seasoned foods, excessive tea or coffee drinking, and indulgences in alcoholic beverages.

The pus organisms have been credited as causal, but the acne bacillus, by some investigators at least, has been considered etiological. Gastro-intestinal derangements predispose while the *Bacillus acne* is apparently causal in the papular type of the disease. In addition in the pustular variety the presence of the *Staphylococcus albus* is probably essential.

Fig. 199.—Acne vulgaris.

Pathology.—Histologically the affection is an inflammation of the sebaceous glands, the process beginning either in or around the gland and the organisms mentioned above are probably causal. There is a superficial or deep inflammatory infiltration of the derma composed of plasma, large fusiform, giant and mast cells, and if suppuration is present, of leukocytes.

Diagnosis.—There should be very little difficulty in diagnosis, as the outbreak consists of follicular papules or pustules, and

commonly the association of blackheads, and at times sebaceous cysts, chiefly found on the face, and at times on the chest, back, and shoulders. Pustular syphiloderm is readily excluded by its generalized distribution. Sycosis vulgaris is distinguished by its limitation to the bearded region, the mustache area, to the male sex, and its discrete pustules, each pierced by a hair. The acne lesions produced by the ingestion of bromides or iodides are more inflammatory than the usual type of the disease, frequently more general in distribution, and there is the history of taking the drug.

Acne rosacea usually develops after thirty years, and is characterized by brighter red lesions, mostly papular, usually but few pustules, and almost total absence of blackheads, rarely sebaceous cysts, and the presence of dilated capillaries.

Prognosis.—Acne vulgaris usually runs a chronic course; at times is rebellious to treatment and tends to relapse.

Treatment.—The patient's diet should be carefully regulated. Fried and greasy foods, pie, cake, candy, pastry, sausage, pork, cheese, pickles, cucumbers, and bananas should be eliminated. Tea, coffee, and alcoholic beverages should be taken in great moderation. Plenty of time should be taken for meals and the food thoroughly masticated. If the patient is anemic, cod-liver oil, arsenic, quinine, and iron may be indicated. Cod-liver oil is an extremely important remedy in pale individuals with oily skins, and deep-seated, sluggish lesions, or in those with numerous blackheads and small lesions.

Treatment of the gastro-intestinal tract, particularly of constipation, is often essential. In cases with a hypoacidity and generally run-down condition the following prescription is of benefit: Acid nitrohydrochloric, 1½ fl. dr. (6.); strychnine sulphate, ¾ gr. (0.048); essence of pepsin and compound tincture of gentian, each 3 fl. oz. (90.); two teaspoonfuls after each meal, well diluted in water, and taken through a glass tube. If there is any hyperacidity and loss of tone of the gastro-intestinal tract, with constipation, the following combination is of use: Bicarbonate of soda, 3 dr. (12.) tincture of nux vomica, ½ fl. oz. (15.); fluidextract of cascara sagrada, 2 to 3 fl. dr. (8. to 12.), compound tincture of cardamom, 3 fl. oz. (90.); a teaspoonful in ¼ glass of water twenty minutes before each meal. If there is some putrefaction of the intestinal tract 2 dr. (4.) of the salicylate of soda may be substituted for the bicarbonate of soda. A mild intestinal antiseptic and laxative may prove of use, such as the hyposulphite of soda, ½ oz. (15.) glycerin and peppermint water each 3 fl. oz. (90.); 2 teaspoonfuls being taken after each meal (Hartzell). If a greater laxative effect is desired the fluidextract of cascara sagrada, in 5 to 10 minim (0.3 to 0.6) doses, may be added. Laxatives alone may be indicated,

such as a 3 gr. (0.18) pill of phenolphthalein each night; a wineglassful of Hunyadi Janos, Friedrichshall, or other aperient water. In somewhat anemic individuals with constipation the disagreeable but efficient "mistura ferri acidi" may be given, which consists of 1 oz. (30.) of magnesium sulphate, 4 to 8 gr. (0.25 to 0.5) of iron sulphate, 1 to 2 dr. (4. to 8.) of dilute sulphuric acid and peppermint-water to make 4 fl. oz. (120.). One tablespoonful is given in ½ a glass of water half an hour before breakfast; if not sufficiently laxative it may also be given at bedtime.

Local applications in acne vulgaris in almost all instances should be of a stimulating character. In treating *superficial lesions* lotions are indicated, while ointments are employed in the elimination of the deeper seated lesions. The lotion most frequently employed consists of the sulphate of zinc and the sulphuret of potash each 15 gr. (1.) to the fluidounce (30.) of water. The drugs should be mixed separately in water and then combined. The sulphate and sulphuret are incompatible, and therefore when they are mixed a white precipitate is thrown down, the latter having the therapeutic action. If greater stimulation is required the two preparations may be used in the strength of 20 or even 30 gr. (1.3 to 2.) to 1 oz. (30.) of the lotion. Frequently a quicker result is obtained by adding 5 to 10 gr. (0.32 to 0.65) of resorcin to each ounce (30.) of the mixture. Boric acid, 1 dr. (4.) to 4 fl. oz. (120.) of alcohol may prove of benefit in the superficial cases in which there are a considerable number of blackheads and an oily condition of the skin. Another favorite lotion, although I have used it infrequently, consists of 4 dr. (15.) of precipitated sulphur, 10 gr. (0.65) of powdered camphor, 20 gr. (1.3) of powdered tragacanth, and 2 fl. oz. (60.) each of lime-water and plain water (*Kummerfeld's lotion*). In the *deep-seated type* of lesions ointments are usually preferred. Those usually employed consist of either precipitated sulphur, ammoniated mercury, or resorcin, in the strength of 40 gr. (2.6) to 1 dr. (4.) to the ounce (30.) of a thin ointment base. In those cases in which there are a considerable number of pustules present, ammoniated mercury is preferred. In the furuncular type of case ichthyol ointment, 25 per cent, or ichthyol plaster is used. My favorite prescription in the *deep-seated cases* consists of: Precipitated sulphur and green soap, each 1 dr. (4.), and lanolin, 6 dr. (24.). If the stimulation is insufficient or benefit is not soon apparent the sulphur and soap are increased to 1½ dr. (6.) each to the ounce (30.), or even 2 dr. (8.) each to the ounce (30.). Frequently a better result is obtained by the addition of salicylic acid, 10 to 15 gr. (0.65 to 1.) to the ounce (30.) of the more stimulating compounds. It is surprising the amount of stimulation some of the sluggish acne cases can stand without irritation.

The patient's face should be thoroughly washed with a mild soap and plenty of warm water night and morning, and after it is dry the lotion should be plentifully mopped on or the ointment rubbed in vigorously. In sluggish lesions, particularly in anemic or pale individuals, the thorough rubbing in of moistened sand soap, once or twice daily, in addition to the ointment, is indicated. Some skins naturally are much more sensitive than others and soap cannot be used on the face, and the preparations have to be used considerably milder than those mentioned. If the preparation does not produce pronounced redness, burning for more than five minutes and only a slight amount of peeling it can be continued.

Vaccine treatment in the hands of most users has given the best results in the markedly pustular type of case. Engman, however, has obtained excellent results from the use of the *Bacillus acne* alone in 3,000,000 to 5,000,000 doses, given every five to seven days in all types of the disease. Excepting in the papular type of the disease, with very few pustules present, most dermatologists give the *Bacillus acne* combined with mixed staphylococci. If there are a considerable number of pustules present the *Staphylococcus albus*, 50,000,000 to 150,000,000, are given with the *Bacillus acne*. Although autogenous vaccines are preferred, stock preparations give an almost equal result in most instances.

Roentgen-ray exposures may be employed in cases with deep-seated lesions. One-half unit is given every two weeks; about eight treatments are employed.

Acne vulgaris attacking the back is usually treated with the zinc sulphate and potassium sulphuret lotion or with sulphur ointment ½ dr. (2.) to the ounce (30.). A dusting powder containing precipitated sulphur, 10 to 20 gr. (0.65 to 1.3); sodium salicylate, 10 gr. (0.65); boric acid, 1 dr. (4.); powdered talcum, 1 oz. (30.), may also be used.

Acne Varioliformis.—**Synonym.**—Acne necrotica.

Symptoms.—The affection usually occurs on the forehead, at the margin of the hairy scalp, and less often on the sides and other parts of the face and neck. Exceptionally in addition lesions may be observed on the chest, the back, and the scrotum.

The outbreak consists of indolent, red, flat papules or nodules about hemp-seed in size, firm in the beginning but later suppurative at the apex, and drying up into small, flat, closely adherent scabs. When the lesions disappear a pit-like scar ⅛ inch or larger remains, which is at first dark red, later brownish and eventually becomes white. They resemble closely the scars following smallpox. The lesions are masses together without definite grouping on the temples and hairy margin of the forehead, while in other locations they are irregularly disseminated. Frequently there are but a few lesions

present. The eruption is painless but itches moderately or severely. The disease runs a chronic course and tends to recur. In certain instances it has run an intermittent course for ten to thirty years.

Etiology.—It occurs in both sexes, usually after thirty years of age. There is frequently an associated oily seborrhea.

Pathology.—The changes in the skin are inflammatory in character and there are frequently large numbers of staphylococci present.

Diagnosis.—The disease has to be particularly differentiated from folliclis and acnitis. The differentiation is given under these two conditions.

Prognosis.—The outbreak tends to recur.

Treatment.—Ammoniated mercury ointment, in a 4 per cent strength, is suggested. Moderate doses of Fowler's solution has assisted in the eradication of the condition in certain instances. Roentgen-ray therapy is unquestionably of use in outbreaks on the smooth skin.

ACNE ROSACEA.

Definition.—A chronic disease of the face characterized by congestion, capillary dilatation, papules, pustules, and occasionally hypertrophy of the tissues.

Symptoms.—The disease frequently starts with a temporary redness which eventually becomes more or less constant. The congestion may be bright or dull red in color or of a bluish tinge. Later a few or many capillaries become permanently dilated. In addition there are papules, a few pustules, and occasionally blackheads. There may be an associated oily seborrhea or seborrheic dermatitis. The nose, the cheeks, and the forehead, particularly the first, are the sites of attack.

Exceptionally the nose becomes slightly or markedly enlarged, the gland mouths widely dilated, and a tumor-like lobulated appearance is produced (*rhinophyma*). The color in this variety of the disease is a bright red or purplish-red.

There may be slight itching and burning, and in the hypertrophic cases some soreness.

Etiology.—The affection develops usually after thirty years of age, and both sexes are attacked, women possibly more often. The predisposing factors are almost the same as in acne vulgaris. Tea, coffee, and alcoholic beverages have a marked influence in causing a relapse or making the outbreak more severe.

Pathology.—There is originally a hyperemia, with secondary involvement of the sebaceous glands, and in the hypertrophic variety connective-tissue growth and enlargement of the sebaceous glands.

Diagnosis.—The disease is distinguished from acne vulgaris by the erythematous flush, the dilated capillaries, the age of the patient, comparatively few pustules, less frequent occurrence of blackheads, and the almost total absence of sebaceous cysts. Its localization, the lack of characteristic grouping, of ulceration, and scar formation eliminate tertiary syphilis. The absence of yellowish-brown deep-seated nodules and the age of development exclude lupus vulgaris. Erythematous lupus consists of marginated pinkish-red plaques, not papules and dilated capillaries. The

FIG. 200.—Acne rosacea.

hypertrophic variety of acne rosacea is distinguished from lupus vulgaris and nodular syphiloderm by the fact that it does not so often break down and form ulcers and scars.

Prognosis.—The disease runs a chronic course and tends to relapse. If the patient follows treatment conscientiously the condition can be eradicated

Treatment.—The diet and internal treatment is practically the same as suggested for acne vulgaris. It is particularly important to exclude tea, coffee, and alcoholic beverages from the dietary.

Locally, lotions usually prove of greater benefit than ointments. In the very inflammatory cases, soothing lotions should be applied; a saturated solution of boric acid or a lotion containing powdered calamin, 2 dr. (8.) powdered zinc oxide, 1½ dr. (6.); glycerin, ½ fl. dr. (2.); rose-water, 3 fl. oz. (90.). A mild preparation which also is effective consists of resorcin, 20 gr. (1.3); powdered bismuth subcarbonate, 2 dr. (8.); glycerin, 40 minims (2.6); lime-water, 4 fl. oz. (120.).

After the acute inflammatory symptoms have subsided somewhat stronger preparations are indicated, such as boric acid, 1 dr. (4.)

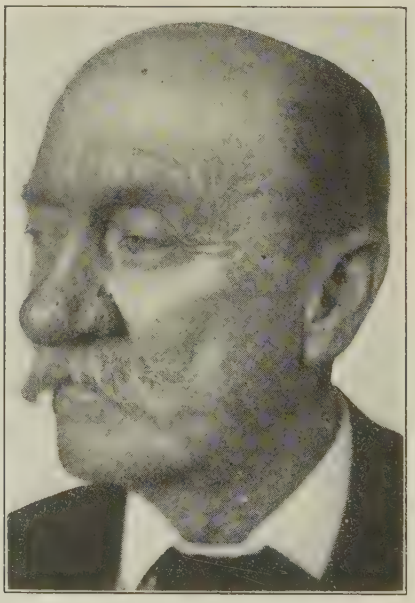


Fig. 201.—Hypertrophic form of acne rosacea. (Rhinophyma.)

to the fluidounce of alcohol (30.); or a usually more efficacious compound, zinc sulphate and potassium sulphuret, each 5 to 10 gr. (0.32 to 0.65), to the fluidounce (30.) of water. Kummerfeld's lotion, mentioned under acne vulgaris, may also be employed in one-half the strength. A sulphur ointment consisting of precipitated sulphur, 20 gr. (1.3), or ½ dr. (2.) of ammoniated mercury to the ounce (30.) of petrolatum may be used.

The permanently dilated capillaries can be obliterated by means of an electric needle fastened to the negative pole of the battery and using a current not stronger than 2 ma. The needle is inserted

into the vessel and as soon as blanching occurs is removed and put again into another portion.

Roentgen-ray therapy frequently is helpful, $\frac{1}{4}$ unit doses in the mild cases, and $\frac{1}{2}$ unit in the more severe is indicated.

C. DISEASES OF THE HAIR AND THE HAIR-FOLLICLE.

CONCRETIONS OF THE HAIR.

Lepothrix.—This is the term applied by Erasmus Wilson to the disease first described by F. V. Paxton, which is characterized by the development of nodes of a grayish-yellow, yellowish-red or

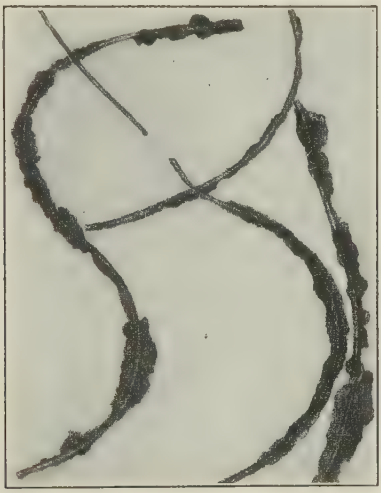


FIG. 202.—Lepothrix. Axillary hair. (Darier.)

brown color surrounding the hair. They are most frequently found in the axillæ, although the chest, pubes, and the inner surface of the thighs may be attacked. When the hair is dry the small growths are hard in consistency. They may attack any portion of the hair but do not involve the follicle. The hair may be normal in length, somewhat shortened, and terminate in a knob. Uncleanliness is not etiologic. The disease is more often seen in the blond type and in those who sweat profusely. It occurs rather infrequently in this country, but is seen in a large proportion of cases in Germany.

Etiology.—The disease is caused by a species of *schizomycetes,* forming masses (zoöglea) upon the hair.

Diagnosis.—The affection is to be distinguished from red chromodrosis (*pseudochromodrosis*) described under diseases of the sweat

glands, in which the formations on the hair are of soft consistency rather than hard and stain the underclothing in contact a red or orange color.

Treatment.—A cure is readily accomplished by washing with soap and water, and the thorough application of either corrosive sublimate or a saturated solution of boric acid.

Piedra.—There are two varieties of the disease: The one attacks the scalp hairs alone, and has been found in the United States of Columbia; and the other develops mostly on the hair of the beard, and has been seen in various portions of the world. To the latter variety the term *piedra nostras* has been applied.

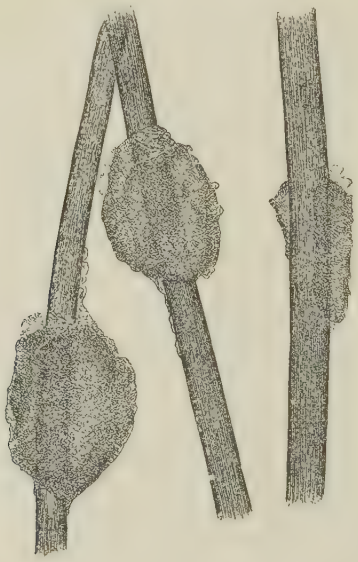


FIG. 203.—Piedra nostras. (Darier.)

Symptoms.—The disease is characterized by minute brownish nodes, one or more of which occur along the shaft of the hair. These growths are so diminutive that they are usually felt as uneven, gritty areas in the hair, rather than seen with the eye. They are separated from each other by a space of from 1 to 2 cm., the first one being about ½ inch from the scalp. The hair exhales an acid odor. Destruction is not caused by the disease.

"*Chignon disease*" (chignon fungus), described by Beigel and T. Fox, is an identical condition.

Etiology.—The disease is observed almost exclusively in women and on the long scalp hairs. It has been observed exclusively in

the warm valleys of the State of Cauca. It is thought that while heat is essential for its production there must be, in addition, the application of the peculiar mucilaginous linseed-like oil which is used by the natives to keep the hair shiny, or the employment of the mucilaginous water from stagnant rivers.

Pathology.—The hair is dark, weak and flaccid. It is difficult to cut the nodes, which may break when considerable force is exerted. Microscopically there is the appearance of a honeycomb mass, which consists of spore-like bodies with a deeply pigmented surface. Bodin termed the fungus *Trichosporon giganteum*, and he also carried out cultural experiments.

Diagnosis.—It is distinguished from trichorrhexis nodosa by the stone-like hardness of the nodes and by its predilection for the scalp hairs.

Treatment.—Thorough washing with soap and water followed by a solution of corrosive sublimate (1 to 1000) cures the disease.

Piedra Nostras.—Piedra nostras is characterized by hard, smooth, poppy-seed nodes and elongated sheaths of a brownish hue which develop upon the hair of the mustache and beard. They vary from 2 to 12 mm. in length, and are about twice the width of the attacked hair. The hairs are normal. The disease is due to a fungus growth about the hairs. The exact classification of the growth is not absolutely determined, although they probably belong to the epiphytes (Joseph). Behrend named the parasite *Trichosporon ovoide*. The nodes are larger and the distribution different from the other forms of piedra. The treatment is the same.

Tinea Nodosa.—An affection described by Cheadle and Morris, and characterized by irregular, nodular, dull brown, or dark brown masses which are found along the course of or surrounding the hair shaft. The hairs of the bearded region and rarely those of the mustache are attacked. The root and lower portion of the hair are usually normal, the masses attacking the upper portion of the shaft. The substance of the hair is not invaded by the fungus but tends to be brittle, to split and break readily. The affection is due to a fungus consisting of spores smaller than those found in ringworm.

Cure is effected by frequent shaving or clipping of the diseased hairs and the application of a saturated solution of boric acid or of corrosive sublimate lotion (1 to 1000).

PLICA.

Plica is divided into two two varieties—*plica polonica* and *plica neuropathica.*

Plica polonica is the term applied to the tangled and matted condition of scalp hairs, which results from lack of cleanliness and care and is associated with lice, eczematous oozing, and extraneous matter.

Plica neuropathica is a rare idiopathic matted or felted condition of the scalp hair. The affection has made its appearance after washing the scalp in warm water; in the regrowth of the hair after typhoid fever; and in nervous individuals.

The matting together of the hairs is usually restricted to a small area not larger than a silver dollar. The hairs are formed into a felted lock of considerable length after years of growth. In Stelwagon's case the growth was four feet in length. J. C. White suggested that it might be due to some peculiar arrangement of the cortical cell.

Both varieties should be treated by excision of the affected areas. The patient frequently objects to excision of the growth, having a superstitious belief that it would prove detrimental to the health.

HYPERTRICHOSIS.

Synonyms.—Superfluous hair; Hypertrophy of the hair; Hirsuties.

Definition.—An excessive or abnormal growth of hair.

Symptoms.—The affection may develop congenitally or is acquired, and has a local (*hypertrichosis partiales*) or more or less general distribution (*hypertrichosis universalis*).

Congenital hypertrichosis is of rare occurrence, the limited variety being more often observed than the generalized. The localized heavy growth usually develops upon a nævus of the pigmented type, and is most frequently observed on the lower part of the trunk, particularly the sacral region. In the universal variety the greatest growth is observed on the normally hairy parts, and in addition there is a perceptible down on other portions of the cutaneous surface, excepting the areas that never show hairs, the palms, the soles, etc. In other cases the downy hairs are not observed until some months or years after birth. These hairs may become pigmented and of the same coloring as the scalp hairs; the face usually shows the anomaly to a more pronounced degree than other portions of the integument. The female as well as the male sex may be attacked. The condition may not only be congenital, but hereditary as well. Defective development of the teeth may be an associated phenomenon.

Acquired hypertrichosis is usually of a limited character, but rarely it may be somewhat generalized. Although hair may be more abundant on the bodies of some individuals than others, the

cases that usually consult the dermatologist are the women with a few long hairs scattered over the face, or a large number of hairs on the upper lip, the chin, the cheeks, and the neck. A few long hairs may be observed around the nipples in the female.

Hairs on the edges of the eyelids may cause considerable irritation by turning inward toward the cornea (*trichiasis*). In rare instances also there may be an additional row of eyelashes on the inner surface of the eyelid near the edge (*districhiasis*), which either develops congenitally or about puberty.

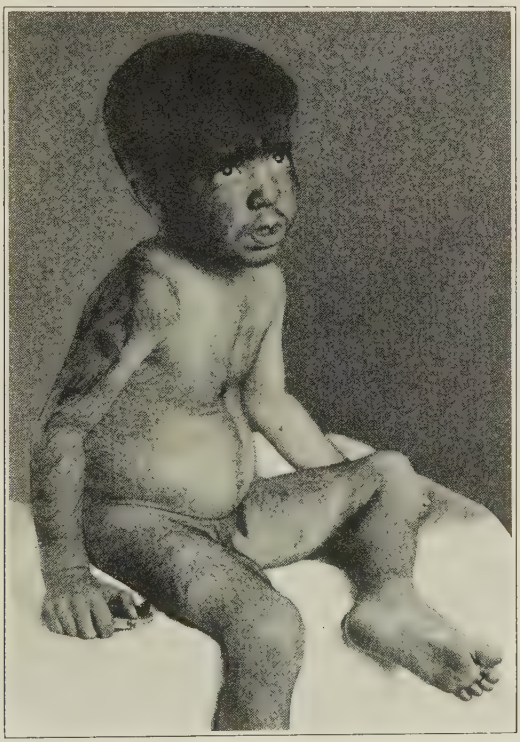


FIG. 204.—Hypertrichosis, so-called "dog-face" boy.

Etiology.—The affection may be congenital or hereditary, but is most often acquired. Certain factors, such as race, dark complexion, utero-ovarian disease, menstrual disorders, local irritation, have all been mentioned as causal, but in a very large proportion of the cases, nothing predisposal or etiological can be determined. The condition, however, is frequently made much worse by pulling out the hairs by tweezers and by all kinds of manipulation in the endeavor to remove the few hairs which may originally be present.

Treatment.—The electric needle is the therapeutic agent that is advocated in all cases that are not too extensive.

The papilla of the hair is destroyed by the electric current, and the hair is permanently destroyed (see section on Electrolysis). In extensive cases depilation can be produced by means of the roentgen-rays, but this method is not recommended. It is an extremely delicate procedure to give a sufficient dosage to cause destruction of the hair follicle and not to cause a severe reaction. Other temporizing means which may be employed are extraction of the hairs with tweezers, cutting the hairs off close to the skin, using a pumice stone, shaving, and depilatory powders. A smooth piece of pumice stone gently rubbed over the affected parts every few days keeps the hairs even with the skin surface. One of the best depilatories (Duhring) consists of 2 to 4 dr. (4. to 8.) of freshly prepared barium sulphide, powdered zinc oxide and powdered starch each 2 to 3 dr. (8. to 12.), to make an ounce (30.), using a sufficient quantity of the two latter preparations. Sufficient water is added to this mixture, at the time of application, to make a paste. This is thickly spread on the area to be treated, allowed to remain until there is a slight sensation of heat or burning, not longer than one or two minutes, and then scraped off. A little talcum powder may be dusted on the slightly reddened surface. With the reappearance of the hairs the procedure is repeated. Hydrogen peroxide has been used either undiluted or combined with an equal quantity of water, so as to avoid irritation, as a bleaching agent, particularly for the dark hairs.

ATROPHIA PROPRIA PILORUM (ATROPHY OF THE HAIR).

Atrophy of the hair is characterized by changes of an atrophic or destructive type of either known causation, as from invasion of parasites into the hair, or about the hair roots or due to some constitutional disease like syphilis, diabetes, fevers, phthisis, etc., or of undeterminable cause. The hairs become dry and lusterless, of smaller diameter, tending to split and break up. The four varieties of this affection are termed *fragilitas crinium, trichorrhexis nodosa, monilethrix,* and *end atrophy.*

Fragilitas Crinium.—The hair is extremely brittle, breaking with the slightest traction, or the hair may split from brushing or combing. The end of the hair may divide into three or four filaments, the split extending as far down as the root. The disease usually attacks the long scalp hairs of women or those of long-bearded men. Scattered hairs alone may show the anomaly, or it may occur in patches, or yet again a considerable number of the hairs in the region are involved. There may be an accompanying folliculitis,

and in some cases the cuticle alone is affected. The cause is unknown, but it is probably trophic and due to a nutritional change. The hairs should be closely clipped.

Fig. 205.—Trichorrhexis nodosa. (After Schwimmer.)

Trichorrhexis Nodosa.—A condition characterized by peculiar nodes on the shaft of the hair, which suggests nits. The hair tends

to break through the nodes. There may be several nodose lesions on a single hair. The impression is given that the hair has burst at the nodular swelling. The appearance is as if two brushes had been jammed together. If the hair has completely broken off the end has a tufted character. Exceptionally the hair may split longitudinally. The nodes are of a whitish or grayish color. The hair is brittle and readily broken by combing or brushing. The affection usually attacks the distal end of the hair. The disease runs a chronic course. The mustache hairs are most frequently attacked, although the bearded region and scalp may show involvement.

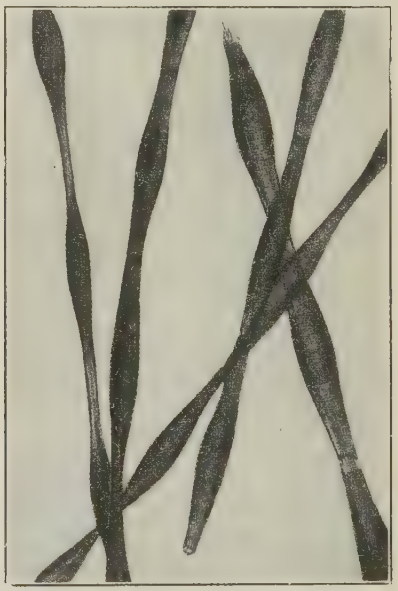


Fig. 206.—Monilethrix. (Darier.)

Etiology.—The disease is of rare occurrence, most often attacking males, although Raymond has found it on the genital hairs of women. It is probably due to an undiscovered parasite. Tooth- and shaving-brushes of those attacked by this disease have shown the same node-like swellings. It has also been suggested that it is due to the gaseous expansion of the medullary portions of the hair which pushes out the cortical substance and finally causes the rupture.

Treatment.—The disease runs a chronic course, and is rebellious to therapeutic measures. The hairs should be kept closely clipped, and if the bearded region is involved the patient should shave daily. The applications which have proved most effective are a saturated solution of boric acid, combined with $\frac{1}{2}$ to 1 gr. (0.03 to

0.06) of corrosive sublimate to the ounce (30.), or precipitated sulphur, ½ to 1 dr. (2. to 4.) to the ounce (30.) of petrolatum.

Monilethrix.—A rare affection of the hair usually limited to the scalp, characterized by elongated, fusiform-looking nodes, with a thinned atrophic appearance of the hair between these various swellings. The hair has a beaded appearance, the nodules are much darker than the connecting atrophic portions, the latter may be almost colorless, and there is a ringed aspect; the entire hair shaft is involved by the process.

The hairs break easily, not as in *trichorrhexis nodosa* through the nodes, but at the thinned portions between these swellings; the fractured end has a tufted appearance. The hairs are so readily broken that they are extremely short and project only slightly above the skin surface. In addition there may be a slight or marked alopecia. The hair follicles are more prominent than normally. There is apt to be hereditary history, and in most cases it is congenital. A follicular hyperkeratosis (keratosis pilaris) is frequently associated. Bacteriological examination has proved negative. Treatment consists in general and local improvement of the nutrition, although benefit is not to be expected.

CANITIES.

Synonyms.—Grayness or whiteness of the hair; Atrophy of the hair pigment.

Symptoms.—The affection may rarely occur congenitally, but usually it is acquired. Congenital patchy canities is apt to be hereditary, the affection being observed in several generations. The general whitening of the hair is associated with albinism.

In the acquired form the condition is normally present with advanced years, but it may occur in certain individuals, particularly those with dark hair, at a very early age. It usually slowly involves all of the hairs; the well-known "iron-gray" appearance is first noticed. The scalp in most instances shows the graying and whitening first. Frequently at a considerably later period the beard and the mustache exhibit the change and still later the eyebrows. The hairs on the general surface may eventually share in the process. Patchy whitening of the scalp hair is most often observed in areas of vitiligo or in the newly grown hairs of alopecia areata; in the latter condition, in the great majority of instances, they become pigmented. Rarely, and apparently authentically, graying of the hair has occurred in a few hours or days.

Etiology.—Heredity and advanced years are the chief etiological factors; although excessive mental work, prolonged anxiety, worry,

nervous derangements, neuralgias, operations, etc., have all been cited as predisposing at least.

Pathology.—Grayness is the result of the lack of pigment production in the hair papilla or due to the presence of air in the cortical portion, or the combination of the two.

Prognosis.—Canities is progressive and permanent. Some few cases have been recorded of the return of the natural color.

Treatment.—There is no cure for the affection. Hair-dyes have been used, but they are not advocated.

Ringed hair is an extremely rare condition, in which narrow, ring-like, white, and pigmented bands, the latter the normal shade of the hair, are present. Excepting for the ring-like aspect, the hairs are of the normal thickness and do not contain nodes such as are found in monilethrix. The scalp hair is apt to be attacked, exceptionally the mustache. The condition is apparently in most instances acquired, although both hereditary and congenital examples have been reported.

DISCOLORATIONS OF THE HAIR.

Other color changes in addition to those mentioned have been observed, usually in the neurotic or from the ingestion of certain drugs, such as periodical differences in the hue of the hair, changing from a reddish blond to a light yellow, from a light shade to a black, brown, or red color. In addition there are anomalous instances of green hair, blue hair, and other unusual color combinations, due to local action of chemicals or drugs, or to the occupation of the individual. Certain lotions or ointments have also given rise to pigment changes in the hair by their local application to the scalp, chrysarobin causing a yellowish-red staining, and resorcin a reddish-brown discoloration, if used over too long a period on blond hair.

ALOPECIA.

Definition.—Alopecia is an affection characterized by loss of hair, which may be partial or complete in the area attacked, localized or generalized, congenital or acquired.

Alopecia is divided into the *congenital* or *acquired.*

Acquired alopecia is classed as:

1. Symptomatic alopecia.
2. Idiopathic premature alopecia (alopecia prematura).
3. Senile alopecia.
4. Alopecia areata.

Congenital Alopecia (Alopecia Adnata).—This variety is of rare occurrence and may be only in patches, or the general hair growth

is simply scanty, incompletely grown, or downy in character, or exceptionally the hair has been entirely absent. In the latter instances there is usually defective development of the teeth, and occasionally of the nails. These cases are apt to occur in several members of a family and their ancestors. The sebaceous glands in some of the cases open directly upon the skin instead of into the hair follicle, and there may be an atrophy or absence of the latter.

Symptomatic Alopecia.—This variety has a recognized generalized or local causation. The hair loss takes place either gradually or rapidly, and may be temporary or permanent.

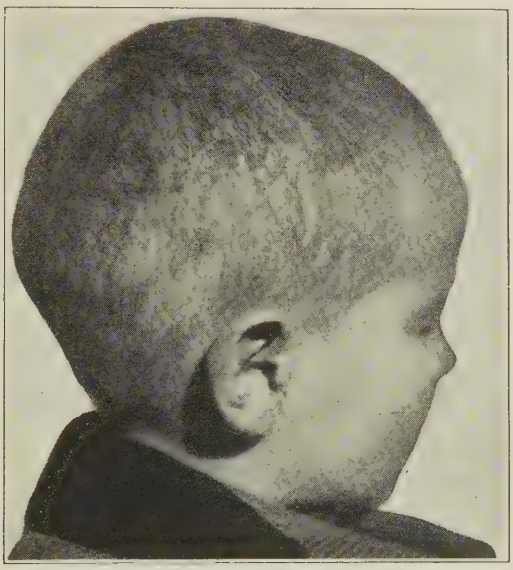


Fig. 207.—Congenital alopecia (atrophia propria pilorum).

The hair loss from generalized causes is usually a thinning process rather than a patchy formation. After fevers or other severe acute systemic diseases, rapid falling of the hair (*defluvium capillorum*) not infrequently occurs. The nutrition is impaired by toxemias, and after these are removed there is a fairly rapid regrowth. Hair-fall has been frequently observed during the course of or following erysipelas, typhoid fever, variola, scarlatina, pregnancy, leprosy, myxedema, neurasthenia, chronic intoxications, anemia, diabetes, cancer, uric acid diathesis, phthisis, etc. In the secondary stage of syphilis there is a thinning of the scalp hair, occasionally also of the other hairy parts. Alopecia of toxic origin may be caused by the administration of thallium acetate.

The most frequent of the local causes of hair-fall is *seborrhea* (dandruff), which may act alone or in combination with hereditary tendency; this has been estimated by Jackson as the exciting factor in 75 per cent of his cases and by C. J. White in 79 per cent. Sabouraud considers his microbacillus of seborrhea as the cause of the baldness by the production of the dandruff.

The other localized cases which may give rise to a thinning of the hair are eczema, seborrheic dermatitis, psoriasis, and ringworm.

Those conditions which cause patchy and permanent hair loss, either because of atrophy or scarring of the area are *lupus erythematosus, folliculitis decalvans, favus,* the *late ulcerating syphilodermata, morphœa, leprosy, burns,* etc.

Idiopathic Premature Alopecia.—In this variety of alopecia there is no determinable cause except hereditary influence. The course of the hair loss is gradual, usually starting at the apex, occasionally anteriorly at the temples, and spreads backward. It frequently thins both at the forehead and centrally and eventually in certain instances the major portion of the scalp hair is lost. A slight or moderate downy growth may take the place of the thick hairs, but there is finally a total hair loss of the attacked surface. As has been mentioned under symptomatic alopecia, premature hair loss is frequently preceded and accompanied by a seborrhea. This form of alopecia is observed between the ages of twenty and thirty-five years, and the males are most often attacked. It is apt to be observed among mental workers, particularly of a professional class. Predisposing causes which have been mentioned are constriction of the temporal arteries by stiff hatbands, thus interfering with the nutrition of the scalp; too great an exposure of the uncovered head to the summer sun; too infrequent or too frequent use of soap and water; and the fact that the scalp is too firmly bound down and not sufficiently movable.

Alopecia Senilis.—Senile alopecia is the natural consequence of advanced age which occurs chiefly in men. This hair loss usually starts on the summit of the scalp and spreads forward and laterally. Some observers have found a thinning of the hairs on other portions of the body, as well, while others have found an increased hairness on the general surface. The follicular openings on the scalp finally become obliterated and the skin surface is smooth and shiny. Microscopically, atrophic changes are found, and there is considerable thinning of the corium and subcutaneous tissue. There are, according to Michelson, preceding alterations in the blood-vessels, the cutaneous arteries become narrowed by a fibrous endarteritis, and there is destruction of the capillary network.

Prognosis.—Congenital alopecia rarely is cured, although in some improvement occurs. The hair almost invariably returns normally,

and occasionally thicker than before the attack, in symptomatic alopecia following fevers and constitutional disorders. In symptomatic alopecia of local causation the hair frequently returns unless the underlying disease has caused permanent atrophy or scar formation. There is very little hope for regrowth of hair in senile alopecia.

Treatment. A careful history should be taken to ascertain if there is any underlying condition and proper treatment directed toward the cause of the affection. In the congenital cases which are so frequently associated with other developmental defects very little can be done except to place the patient in the best possible condition. Every phase of the daily life has to be carefully studied as to exercise, food, hygienic surroundings, and as to the general nutrition. Cod-liver oil and syrup of the iodide of iron may be indicated. If the patient is anemic or not physically strong, arsenic, iron, quinine, and strychnine may be indicated. In treating symptomatic cases from general disease the patient frequently has to be built up by the tonics just mentioned; if of syphilitic origin, mercury or arsphenamine are indicated; if associated with diabetes, etc., internal medication is given for these conditions. If caused by eczema, psoriasis, or ringworm the applications have to be directed to these diseases. Treatment of seborrhea, which is so prolific of hair fall, is given under that disease. No applications or internal treatment are of benefit in atrophied or scarred patches.

Shaving or singeing of the hair has absolutely no effect in causing the return of the fallen hair or in strengthening that which remains. It is well, however, to keep the hair closely clipped, because the applications are more readily applied. The various lotions mentioned under seborrhea, particularly those without resorcin, and applied in the same way, should be used in this condition. Two other lotions might also be mentioned, the first advocated by Elliot and C. J. White: Bichloride of mercury, 1 to 2 gr. (0.06 to 0.12); euresol, 1 dr. (4.); spirits of formicarium, 2 to 4 dr. (8. to 16.); castor oil, $\frac{1}{2}$ to $1\frac{1}{2}$ fl. dr. (2. to 6.); alcohol, sufficient to make 4 fl. oz. (120.); and the second consists of tincture of cantharides, $\frac{1}{2}$ to 1 fl. oz. (15. to 30.); tincture of capsicum, 20 to 60 minims (1.3 to 4.); bay rum, 4 fl. oz. (120.).

The ointments suggested under alopecia areata to the exclusion of chrysarobin may also be used.

Personally, if the patient does not object to an ointment I would suggest the use of betanaphtol, with a starting strength of $\frac{1}{2}$ dr. (2.) to the ounce (30.) of equal parts of lanolin and petrolatum, increasing the preparation to 1 dr. or $1\frac{1}{2}$ dr (4. to 6.) to the ounce (30.) if too much burning and irritation are not produced. Frequently the addition of 10 to 20 gr. (0.65 to 1.3) of salicylic acid to

the ounce (30.) of this is beneficial. I am also very apt to use in long hair which is considerably thinned one of the favorite prescriptions of C. N. Davis: Resorcin, 1 dr. (4.); salicylic acid, ½ dr. (2.); castor oil, 8 minims (0.5); alcohol, 2½ fl. oz. (75.); camphor-water sufficient to make 3 fl. oz. (90.). The resorcin should be used for not more than two or three weeks in light or gray-haired individuals for fear of staining; after its limited application, bichloride of mercury, 1½ gr. (0.09), is substituted in the last prescription.

Ointments are thoroughly rubbed in twice daily, using only a small quantity at each application. Lotions are applied with an eye-dropper and rubbed in with rubber gloves or a brush. The scalp should be washed not more frequently than every two or three weeks. A mild soap is employed, such as boric acid. Results can be obtained only by conscientious coöperation on the part of the patient and after months of treatment.

Alopecia Areata.—**Definition.**—An affection characterized by total hair loss in circumscribed areas or of universal distribution.

Symptoms.—The disease usually develops rapidly, at times somewhat slowly, the hair falling out in patches. The bald areas are usually the size of a quarter to half a dollar, and there may be but one, two, or three, or several present. The affected patch is entirely denuded of hair, slightly depressed, smooth, the hair follicles are either less prominent than normally, or undiscernible, the surface is white, not inflamed, and without scale. The hairs surrounding the patch are firmly fastened in the follicles and are pulled out with a considerable amount of traction, unless the area is spreading. There may be, instead of a rounded patch, a linear area usually extending along the hair line, at the back or side of the neck, or at the hair-line of the forehead. Circumscribed patches are not only found on the scalp, but in certain cases, in the bearded region, either alone, or combined with the bald areas on the head. Small patches may run together and large areas are thus formed, or the one spot may enlarge until a considerable portion of the scalp is denuded of hair. Occasionally the hair loss is more or less generalized, not only on the scalp, but the eyebrows, the eyelashes, the beard, the mustache, and in the axillary and pubic regions as well. Exceptionally every hair, including all of the lanugo growth, is lost (*alopecia universalis*). The condition runs a chronic course, but frequently the patches after reaching a certain size tend to remain stationary. In favorable cases the hair returns first as a downy growth, frequently of a pale or white color, and as it grows thicker and stronger becomes pigmented of the natural color of the surrounding hairs. Nail changes have occasionally been associated.

Etiology.—The disease is usually observed between the ages of ten and twenty-five years. Rarely under five or in those older than

forty. It is of comparatively infrequent occurrence, and either sex is attacked. Two theories have been advanced as to its causation: One the parasitic, and the other trophoneurotic. The few epidemics of the affection should probably be classed under the ringworm of the bald type rather than alopecia areata. Parasitic evidence of the causation of the disease has been so meager, in this country at least, that it can hardly be considered as etiological. As it is unusual to find more than one case in a family, both the contagious nature and heredity can be reasonably excluded.

FIG. 208.—Alopecia areata of beard.

In regard to the neurotic theory of causation, numerous instances of the affection have followed fright, shocks, accidents, great anxiety, mental worries, etc. Other factors which have been mentioned are peripheral irritation from defective teeth and other reflex causes, such as defective vision, nasopharyngeal disorders, and changes in the nerves.

FIG. 209.—Alopecia areata.

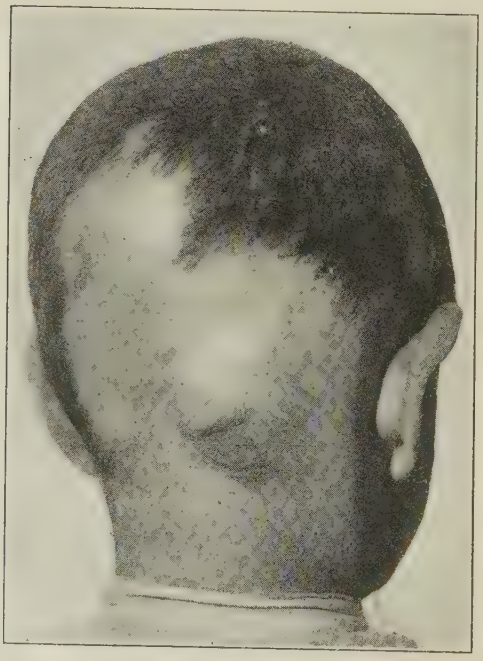


FIG. 210.—Alopecia areata.

Pathology.—Although numerous organisms have been found in the tissues, none can be considered as causal. In experiments on animals several investigators have found that excision of the second cervical ganglion was followed by bald areas in the region covered by the distribution of the second cervical, the great auricular, and the occipital nerves. Robinson considers that the primary changes occur in the bloodvessels and lymph channels, and subsequently glandular atrophy is produced by obliteration. The hair fall is caused by an acute thrombic closure of the vessels. The inflammatory process has its seat in the papillary portion of the corium.

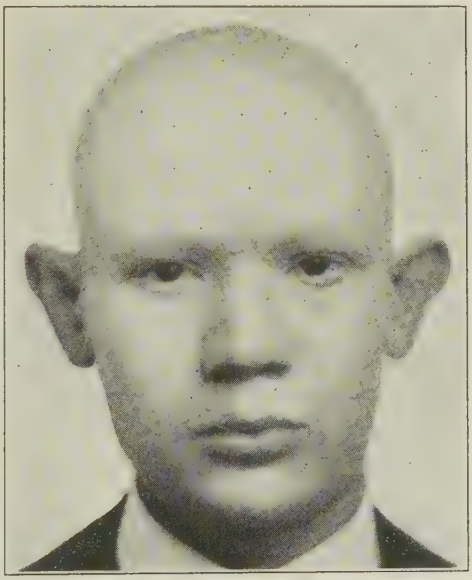


FIG. 211.—Universal alopecia areata.

Diagnosis.—The disease has to be specially distinguished from ringworm of the scalp; the differentiation has been tabulated under that affection.

Syphilitic alopecia usually shows a thinning of the scalp hairs, "moth-eaten" appearance, and not totally bald areas.

Prognosis.—Recovery is to be expected in circumscribed patches in the scalp. Bald areas of the bearded region are more difficult to cure. Cases of universal alopecia areata frequently do not recover their hair. The longer the bald areas have been present the less favorable is the prognosis. Relapses frequently occur. In one instance I have seen five relapses in eight years, the entire scalp hair falling on each occasion. Treatment has to be pro-

longed for months. In numerous instances there has been no sign of returning hair for at least two or three months after therapeutic measures were started.

Treatment.—The history of the hair fall should be carefully ascertained, and if there is any ascertainable underlying cause it should be eradicated. If the patient's general condition is in any way deranged it should be corrected by tonics or whatever measures are necessary. In extensive instances the two medications usually prescribed are some form of arsenic or thyroid gland, the dosage depending upon whether the patient is a child or an adult. Arsenic is given in most instances in the form of Fowler's solution, 5 minims (0.32) three or four times daily. Desiccated thyroid is prescribed in 2- to 5-gr. (0.12 to 0.32) doses in capsules after each meal, and frequently an additional dose at bedtime.

Ointments are usually employed in the local treatment. The preparations most frequently used are betanaphtol, precipitated sulphur, the tar compounds, salicylic acid, and, for one or two small areas, chrysarobin.

Personally, I believe there is no better local application than an ointment consisting of: Pilocarpine hydrochlorate, 1 gr. (0.06); betanaphtol, 1 dr. (4.); lanolin, 2 dr. (8.); petrolatum, 5 dr. (20.). The preparation is rubbed thoroughly into the areas twice daily for five to ten minutes on each occasion. There should be produced a slight sensation of warmth or burning or slight temporary redness. The preparation has to be increased in strength when the reddening of the surface is no longer caused or there is no sensation of burning. This preparation may be used $1\frac{1}{2}$ (6.) and occasionally even 2 dr. (8.) to the ounce (30.). Frequently the addition of 10 to 20 gr. (0.65 to 1.3) of salicylic to the ounce (30.) is of benefit, or precipitated sulphur, $\frac{1}{2}$ to 1 dr. (2. to 4.) to the ounce (30.) of the base, is also added. It is rather odd in this disease that relapses often do not respond to the preparation that originally brought the hair back, and therefore a new medicine is required. Liquor carbonis detergens, 1 to $1\frac{1}{2}$ fl. dr. (4. to 6.) to the ounce (30.), either alone or combined with salicylate of soda, 20 to 30 gr. (1.3 to 2.) is efficacious. Crude coal tar, undiluted, although disagreeable to use, may cause a return of the hair after all other measures have failed. Oil of cade, 1 to 4 fl. dr. (4. to 15.) to the ounce (30.) of olive oil, although of benefit, has a pungent odor, and because of its oily consistence is not advocated excepting in rebellious cases. Chrysarobin also is held in reserve for use after other methods have proved unsuccessful. It is used 20 gr. to $\frac{1}{2}$ dr. (1.3 to 2.) to the ounce (30.) of lanolin, applied to only small surfaces on the scalp, and care should be used that it does not accidentally reach the eyes. The office application of tricresol,

with its neutralization with alcohol, is also a helpful measure. High-frequency current applied with the vacuum electrode and carbon point for a sufficient length of time to produce a reaction is of value. Actinic light rays, applied by the Kromayer or London Hospital type of lamps, may prove of benefit.

In extensive cases internal treatment is more to be depended upon than local applications. The preparations used on the bearded region or on the eyebrows are of one-half the strength of that used on the scalp, and chrysarobin should not be employed on these areas. The lotions mentioned under alopecia and also those used in seborrhea may be employed, but in my experience are not so effective as the ointments.

TRICHOTILLOMANIA.

Synonyms.—Trichomanie; Tic de l'epilation.

An affection characterized by an abnormal desire on the part of an otherwise apparently sane individual to extract forcibly one or more of his own hairs. The individual effected is seized with this sudden and uncontrollable impulse. Various terms have been applied to somewhat allied conditions. Treatment is practically without avail.

Trichokyptomania.—This is a disorder in which the individual breaks off the hairs instead of pulling them out.

ULERYTHEMA OPHYROGENES.

A disease characterized by a hyperkeratosis and redness of the outer side of the eyebrows with stopping up of the hair follicles and accompanied by lichen pilaris. It is most often located on the eyebrows, although other portions of the face, the neck, the scalp and the arms may be involved. Cicatrices form between the sound hairs. Bald rings may form on the scalp and complete alopecia has rarely resulted. Resorcin lotions, mercurial ointment, and a 5 per cent salicylic acid salve have been employed.

FOLLICULITIS DECALVANS.

Numerous terms have been applied to a group of diseases of hairy parts which is characterized by follicular and perifollicular inflammatory processes; a complete destruction of the hair papillæ, causing absolute baldness, the formation of cicatricial tissue, and a tendency for the lesions to agminate or group.

There are three chief forms of the affection: (1) *Cicatricial alopecia*, or the *pseudopelade* of Brocq; (2) *depilating folliculitis*,

or the *folliculite épilante* of Quinquaud; (3) *ulerythema sycosiforme.* The latter condition is described under Sycosis Vulgaris.

Cicatricial Alopecia (Pseudopelade of Brocq).—This affection usually attacks the scalp and exceptionally the bearded region, and is characterized by slightly rosy-tinted or faintly reddened patches, usually small in size, with slight swelling around the follicles, indicative of a mild inflammatory action. The hairs in the affected area either fall out or can be easily pulled out of the follicles. There may be a few but frequently numerous patches present. Patches are rarely larger than a quarter-dollar in size, and frequently much smaller. The patches eventually become smooth, ivory-like, cicatricial, and permanent baldness results. They are usually rounded, but occasionally irregular in shape.

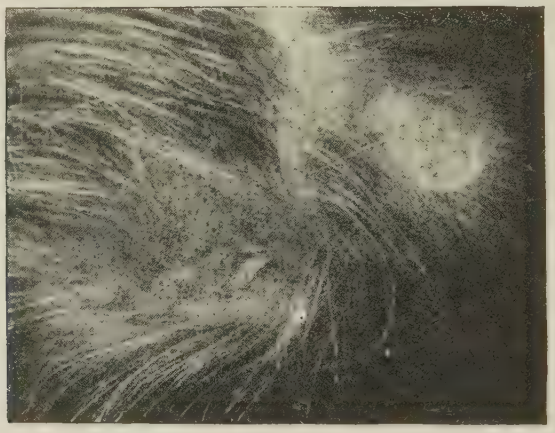


Fig. 212.—Folliculitis decalvans. (Jackson and McMurtry.)

The affection is rare, more common in males between thirty and forty years of age. The cause is unknown. It is rebellious to treatment. The local remedies advocated under Sycosis Vulgaris may be employed.

Depilating Folliculitis (Folliculite Épilante of Quinquaud).—The scalp is most often attacked, but occasionally the beard, axillæ, and the pubic region. It begins with a sycosis with small inflamed papules or pustules pierced by hairs; the latter dry into small crusts. Although the lesions are at first discrete, contiguous follicles become affected and the hairs fall from the diseased areas, leaving permanent minute cicatrices. Eventually bald areas are formed, with a glistening, smooth, cicatricial surface, with red points. There are red papules, pustules, and punctiform miliary abscesses about the spreading edge of the patch, with a central

hair in each lesion. A red point remains where the hair is removed from the diseased follicle. Tufts of normal hair may remain in

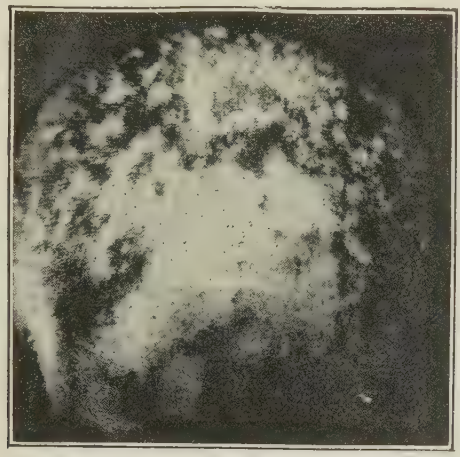


Fig. 213.—Pseudopelade. (Brocq.)

the patch. The disease is slowly progressive, and pruritus may be marked. The folliculitis is much more marked than in cicatricial alopecia (*pseudopelade*).

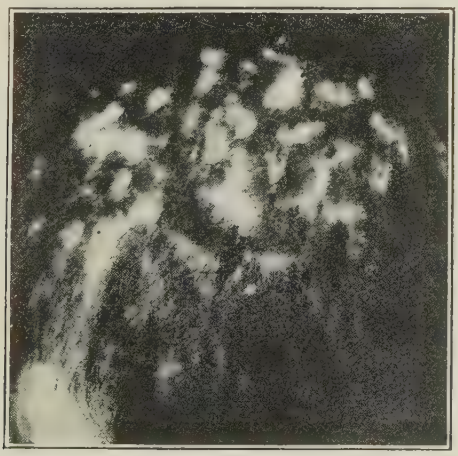


Fig. 214.—Pseudopelade. (Brocq.)

The Staphylococcus aureus has been considered as causal, although Quinquaud has described a micrococcus. Histologically

there are found perifollicular pustules which destroy the follicle. The skin is atrophied.

Arnozan has described a *depilating folliculitis of the limbs.*

The hair cannot be grown in the scar tissue. Ammoniated mercury ointment, ½ to 1 dr. (2. to 4.) to the ounce (30.) of petrolatum, may prove of help in checking the spread of the disease.

Fig. 215.—Sycosis vulgaris, moderate type.

SYCOSIS VULGARIS.

Synonyms.—Sycosis; Folliculitis barbæ.

Definition.—A chronic inflammatory disease of the bearded region and mustache characterized by papules and pustules pierced by hairs.

Symptoms.—The disease begins with the appearance of small discrete red papules, papulo-pustules or tubercles, which become pustular; each lesion is pierced by a hair. The individual pustule is small, yellowish in color, rounded or acuminate, and with no tendency to spontaneous rupture. The lesions may become numerous, and so closely crowded together that inflammatory

patches are formed with some infiltration, slight swelling, and with small projecting lesions. The hairs in the affected area remain firmly fastened in their follicles and do not fall, except in prolonged cases or those in which there is considerable suppuration. The affection may involve only a limited area, such as the upper lip, beneath the nose, or a small or a considerable portion of both the bearded and mustache areas. Exceptionally other hairy portions of the body are attacked by a follicular eruption. The disease runs a chronic course. There may be slight pain, itching, and burning.

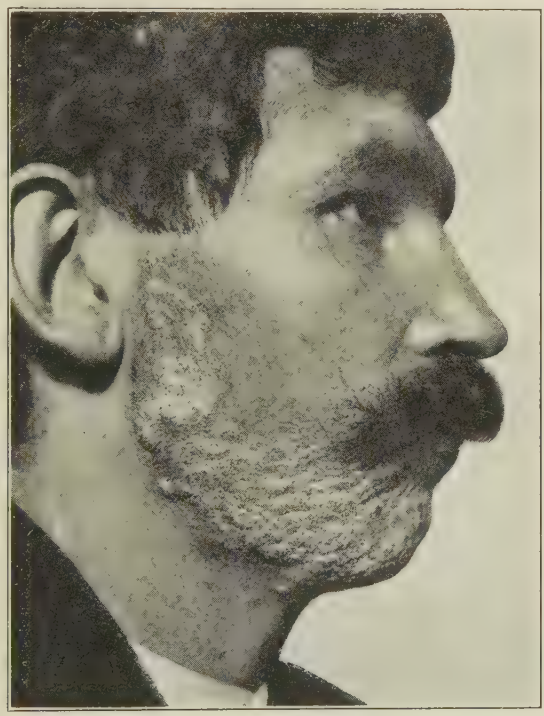


FIG. 216.—Sycosis vulgaris, severe type.

Rarely the disease is limited to the outer portion of the bearded region, in the beginning having the appearance of the usual type of case, but eventually causing a smooth, furrowed, or keloidal scar, total destruction of the hair follicles, and permanent hair loss. The border may be infiltrated, and it tends to spread. This variety of the disease has been termed *lupoid sycosis* (Milton), *sycosis lupoide* (Brocq), and *ulerythema sycosiforme* (Unna).

Etiology.—The affection is apparently due to *pyogenic cocci*, the Staphylococcus aureus and albus, although a bacillus has also

been found. Various names depending upon the microörganisms found have therefore been suggested, *sycosis coccogenica, sycosis staphylogenes*, and in the instance in which a bacillus was discovered *sycosis bacillogenes*. The condition is feebly, if at all, contagious. The disease attacks the male sex between the ages of twenty and fifty years. Local irritation either is predisposing or makes the outbreak more severe, as in those cases attacking the upper lip beneath the nose, in which there is a nasal discharge. Those who work in a dusty atmosphere, who have a seborrhea or eczema of the face, or whose general condition is below par, are more apt to develop the disease. The cause of *ulerythema sycosiforme* is unknown. Probably there is a superadded infection to the ordinary variety of sycosis.

Pathology.—The disease is primarily a perifolliculitis; the follicles and their sheaths later become involved. The inflammatory changes in the skin are supposedly due to a microörganismal invasion. According to Wertheim, each follicle eventually becomes a minute abscess, in which there are abundant cocci. In *ulerythema sycosiforme* there is destruction of the hair follicles, the hair papillæ, the glandular structures, the connective tissue, and scar tissue is formed.

Diagnosis.—The affection has to be particularly distinguished from tinea sycosis, although acne vulgaris, pustular eczema, and impetigo should be differentiated.

Tinea Sycosis.	Sycosis Vulgaris.
Usually limited to bearded region; mustache area exceptionally attacked.	Mustache area attacked as frequently as bearded region.
Runs a course of a few weeks to one or two months.	Runs a chronic course.
Characterized by elevated, carbuncle-like lesions, with surrounding broken-off hairs and prominent hair follicles.	Disease characterized by discrete pustules, each pierced by a hair.
Hair loss and hairs in patch pull out without traction.	No hair loss and hairs fastened firmly in follicles.
Large spore fungus and mycelium found upon microscopical examination of hairs.	No fungus found in hairs.

Pustular eczema is readily excluded as the pustules run together and form large crusted areas which ooze, fade off into the sound skin, and itch intensely. The patches are not limited to the mustache or bearded regions.

Impetigo contagiosa is an acute disease which starts as a vesicle or pustule, the contents become purulent and dry up into honey-colored, stuck-on crusts. The lesions are found on any portion of the face, the scalp and hands as well. The lesions are not pierced by hairs, and are more apt to be found in children.

Acne vulgaris is characterized by papules, pustules, blackheads, and sebaceous cysts. The outbreak is found on any portion of the face, the chest, and the back, in either sex, and usually between the ages of puberty and twenty-five years.

Prognosis.—The disease is extremely rebellious to treatment, and relapses are frequent.

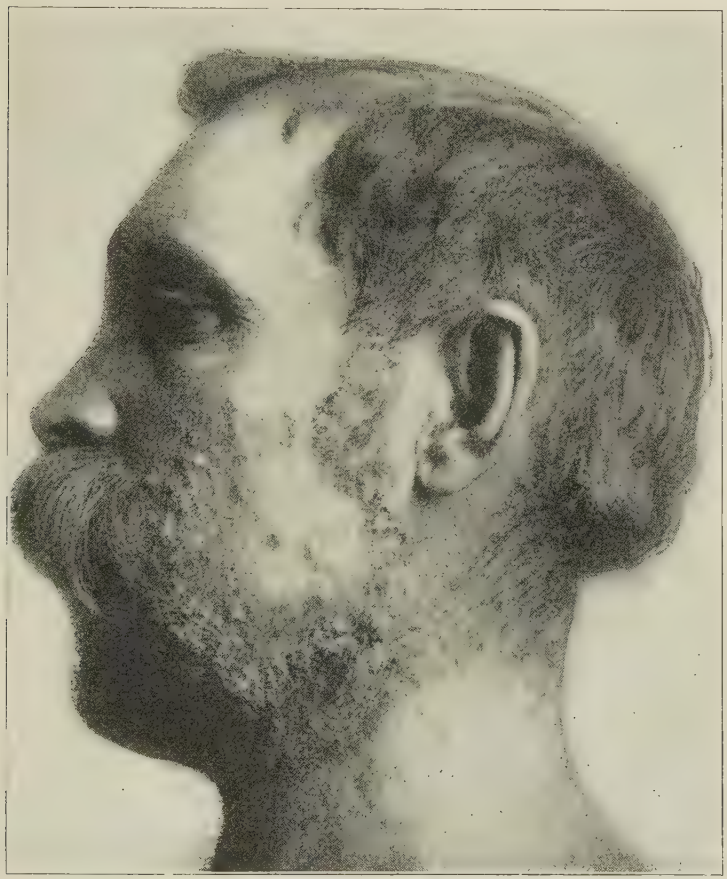


FIG. 217.—Lupoid sycosis. (Ormsby.)

Treatment.—Internal treatment has very little effect upon the course of the disease. The patient should be treated symptomatically, according to any underlying condition that has lowered the general health. Dietetic regulation is without avail; naturally those articles of food which are difficult to digest should be taken

moderately or excluded, particularly also tea, coffee, and alcoholic beverages.

Local treatment is without avail unless the beard or mustache is removed by daily shaving. The importance of this measure cannot be emphasized too strongly. Although numerous applications have been advocated, three preparations, sulphur, mercury, and salicylic acid, usually give the best results. If the disease is limited to the mustache area the following prescription thoroughly rubbed in twice daily is suggested: Ammoniated mercury, ½ dr. (2.); salicylic acid, 8 gr. (0.5); lanolin, 2 dr. (8.); petrolatum, 6 dr. (24.). If this proves irritating the quantities are reduced. After using the application for a week, if there are no signs of irritation the ammoniated mercury is increased to 40 gr. (2.6) and the salicylic acid to 10 gr. (0.65). In some instances it may prove advisable to increase the ammoniated mercury to 1 dr. (4.). The combination mentioned also proves of benefit in invasion of the bearded region, particularly if there is a considerable number of pustules present. In other instances a prescription containing precipitated sulphur, ½ dr. (2.); tincture benzoin, 10 minims (0.65); lanolin, 2 dr. (8.); cold cream, 6 dr. (24.), is advocated. The addition of 10 gr. (0.65) of salicylic acid to the ounce (30.) is also frequently helpful. The precipitated sulphur may be increased to 40 gr. (2.6) or 1 dr. (4.), and the tincture of benzoin also to ½ or 1 dr. (2. to 4.) if there is no irritation produced.

Roentgen-ray therapy is the most effective method of treatment; ¼ unit may be given each week; ½ unit every two weeks, or 1 unit at intervals of four weeks.

If the pustules are large, furuncular-like, an ichthyol lotion, 1 dr. (4.) to the fluidounce (30.) of water, or 1 or 2 dr. (4. to 8.) to the ounce (30.) of petrolatum, is indicated.

Vaccines, whether autogenous or stock, have in most instances proved rather disappointing, excepting in conjunction with local applications. They offer the best chance of success in cases with a large number of pustular lesions. The opsonic index is of value in determining the response to this form of medication, but the clinical results show fairly accurately whether the dose is too large or insufficient. An increase in the number of new lesions show an excessive dose. There is no standard dosage. The initial dose should be about 100,000,000 to 150,000,000 mixed staphylococci; a second injection is given in six days of 200,000,000 to 250,000,000, and a third and subsequent doses at six-day intervals of 300,000,000 to 400,000,000 (Varney). Engman advocates small continuous doses of 50,000,000 to 200,000,000; Gilchrist advises the administration of 300,000,000 every third to seventh day. The English give huge initial doses of dead bacteria, 1,000,000,000 (Colcott

Fox) and even 2,500,000,000 (Little). Response is greater to the vaccine method if heat is applied daily to the affected part.

Sycosis of the upper lip is frequently associated with nasal discharge, and this condition has to be eradicated before a cure can be effected. The conscientious coöperation on the part of the patient is essential to the cure of the condition. Daily shaving should be continued indefinitely even after the disappearance of the outbreak, and applications about one-half the strength of those mentioned should be applied routinely once each day or every other day to avoid the possibility of a relapse.

FOLLICULITIS.

In this affection the follicles are observed to be reddened, swollen, and there are many discrete pustules each pierced by a hair. The legs are the usual sites of attack. It is an analogous process to sycosis. It is most often observed in those who work in paraffine, tar compounds, and other irritating substances. The *impetigo* of *Bockhart*, which is a follicular staphylococcic infection, may be classed as a folliculitis, although it has already been mentioned under Impetigo Contagiosa.

Treatment.—Treatment consists in the application of a saturated solution of boric acid; a preparation containing ichthyol, 2 dr. (8.); boric acid, 1 dr. (4.); powdered zinc oxide, 2 dr. (8.); glycerin, 1 fl. dr. (4.); camphor-water, 4 fl. oz. (120.); or if not too extensive, ammoniated mercury, 12 gr. (0.75) to the ounce (30.) of zinc oxide ointment. The affected parts should be washed twice daily with soap and warm water. Vaccine treatment, as suggested under Sycosis, may be used in rebellious cases.

DERMATITIS PAPILLARIS CAPILLITII (ACNE KELOID).

Definition.—A disease which occurs on the hairy border of the back of the neck, and is characterized by papules, pustules, papillomatous vegetations, and keloidal elevations.

Symptoms.—The affection begins with an outbreak of isolated, sycosis-like, or acne-like, pin-head- to small pea-sized lesions, which increase in size, and with the addition of others become closely grouped. The lesions frequently reach the size of a small cherry, are bright or pale red, or of a whitish color, and sometimes contain pus. Pus may form beneath the mass. In some instances the surface becomes raw and a papillomatous granulation tissue develops. The patch is occasionally covered with crusts, and a

gummy, seropurulent, offensive discharge is exuded. There is more or less scar tissue and keloidal elevations are a prominent feature of the disease. The affection may extend from the borderline of the scalp up toward the occiput; the hairs in the affected area are either lost, atrophied, or crooked.

Etiology and Pathology.—The disease develops in adult life, most frequently in men, and particularly in the negro. The cause of the affection is unknown, although Pusey considers that it is a pustular folliculitis of the hair follicles, due to the common pus organisms. A history of previous injury or boils is frequently elicited.

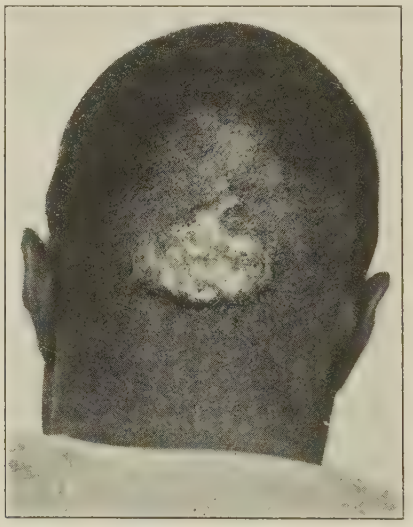


FIG. 218.—Dermatitis papillaris capillitii. (Keloid acne.)

The structure in the earlier stages resembles granulation tissue; later it undergoes sclerosis with atrophy of the hair follicles. There is also a round-cell infiltration in the corium and hypertrophy of the epidermis, enlargement of the papillæ, and the bloodvessels. Staphylococci and acid-fast bacilli, resembling tubercle bacilli, have been found in the tissues.

Diagnosis.—Its location and the peculiar characteristics of the growth, with its keloidal tendency, exclude other diseases.

Prognosis.—It may be progressive, but frequently after reaching a certain development remains stationary.

Treatment.—Although somewhat rebellious to treatment, excellent results may be obtained by roentgen-ray exposures; $\frac{1}{2}$ unit doses are given every two weeks.

Salicylic acid plaster kept constantly applied and changed every four days is also efficacious. An ointment containing 10 to 20 gr. (0.65 to 1.3) of salicylic acid, lead plaster, and petrolatum, each ½ oz. (15.), is also advocated.

D. DISEASES OF THE NAILS.

PTERYGIUM.

This is the term applied to the adherence and growth of the fold of skin over the nail to an abnormal degree. This is normally present to a slight degree where the proximal end of the nail joins the finger. The opposite condition is occasionally observed, in which there is retraction of this fold and exposure of the nail root. Curriers are supposed to be liable to this anomaly. Equal parts of lanolin and petrolatum should be applied each night to soften the nail fold, so that it can be pushed back, or in the latter condition, in the hope that it may grow.

FIG. 219.—Onychauxis.

ONYCHAUXIS.

Definition.—An overgrowth of the nail, which may take place in one or all directions, and often accompanied by changes in shape, color, and direction of growth.

Symptoms.—The affection is usually acquired, although it may be congenital.

Congenital hypertrophic changes are rare, and may be associated with an atrophic condition of the hair. All of the nails of both hands and of the feet at times are attacked, and there may be hypertrophic growth, friability, a tendency to split, to crack, in

some an atrophy rather than hypertrophy, and in addition, *paronychia.*

Acquired onychauxis is usually mild but occasionally severe. There may be a simple thickening or hypertrophic lateral growth with an inflammation of the surrounding tissues (*paronchia*). The nail may become enormous, thickened, and claw-like (*onychogryphosis*). This is particularly observed in the large toe nail. The hypertrophied nail is hard and horny, or friable and tends to break. The nail substance becomes opaque, without luster, the surface often rough and irregular and of a dirty yellow-brown, or blackish color. Longitudinal ridges, protuberances, and depressions are frequently present.

Onychia is an inflammation of the nail bed, and may result from the pressure induced by knocks and the use of the hypertrophic nails, or may exist primarily and lead to atrophic or hypertrophic changes in the nail. The matrix is frequently inflamed, and there may be an associated seropurulent undermining. The nail bed and surrounding tissues often share in the inflammation. The inflammation may be of a malignant character, with destruction of the tissues and involvement of the lymphatics. The nail is cast off and a sloughing surface remains. This type of the affection usually involves but one nail, but occasionally several may be attacked in succession.

Simple paronychia frequently occurs independently of hypertrophic changes and is most often seen about a toe nail as the result of lateral pressure of a normal nail produced by tightly fitting shoes, or from a slight lateral overgrowth (*ingrowing nail*). It is also observed about the finger nails and may be simply a redness or swelling with a purulent discharge. This mild type usually attacks several fingers, and is found in those individuals whose hands are in water for considerable periods, or it may be associated with eczema of the fingers.

Etiology and Pathology.—Advancing years, pressure and warmth, and lack of proper care are contributing causes. Thickened and enlarged nails are at times observed in leprosy, phthisis, acromegaly, syringomyelia, etc. The hypertrophic changes may be found in association with local irritation or injuries, with gout, rheumatism, and various diseases of the nervous system or nerve injuries. C. J. White in an analysis of 485 hypertrophic and atrophic nail cases found that 404 were due to or associated with six diseases: Eczema (107); trauma or felon (72); paronychia (68); psoriasis (67); occupation dermatitis (62), and syphilis (28).

Onychia may be of unascertainable causation or due to slight injury, repeated or persistent irritation from a hypertrophied nail, which offers a favorable soil for pyogenic infection. Syphilis and tuberculosis may cause the affection.

Paronychia is produced by pressure and superadded pus infection. Manicuring with soiled instruments or careless handling is at times causal.

Treatment.—If the underlying cause is determined, treatment should be directed to that end. Tonics may be indicated. Arsenic may be prescribed with success in some of the cases. Care should be taken that shoes fit properly and that injury and infection of the nails are avoided.

Thickening of the nails frequently responds to roentgen-ray treatment, $\frac{1}{4}$ to $\frac{1}{2}$ unit exposures are given. Salicylic acid plaster, cut to fit the affected nail and worn more or less continuously until the softening effect has been sufficient, is efficacious; or salicylic acid, 10 to 20 gr. (0.65 to 1.3) to $\frac{1}{2}$ oz. (15.) each of lead plaster and petrolatum.

Onychia, depending upon its severity, is treated with soakings in a saturated solution of boric acid; ammoniated mercury, 20 gr. (1.3) to the ounce (30.) of zinc oxide ointment; ichthyol, 2 dr. (8.) to the ounce (30.) of petrolatum or surgical interference. The two latter preparations are also applicable to *paronychia.* If the nail is markedly hypertrophic and deformed, or if the inflammatory symptoms are severe, the nail may have to be removed surgically; roentgen-ray exposures are also frequently of benefit in the chronic forms of onychia and paronychia.

ATROPHY OF THE NAILS.

Synonyms.—Atrophia unguium; Onychatrophia.

Condition.—This condition is characterized by various changes in the nails, such as softening, thinning, brittleness, splitting, an opaque and lusterless or worm-eaten appearance. One or more or all of these changes may be present. The affection is congenital or acquired.

The *congenital* cases are rare, and there may be an associated imperfect growth or absence of the hair, and at times defective formation of the phalanges. In a few instances the nails have been absent, although the nail bed and fold were apparently normal. Rarely in the latter cases the nail may develop some years after birth.

Acquired nail atrophy is quite frequently seen and any of the changes mentioned may be present. In its mildest form one or two nails are somewhat thin, particularly at the free border, and there is a persistent central crack or fissure. One, several, or all of the finger nails and toe nails may be involved. It usually begins at the basal portion. Poor health, chronic digestive disorders, affections of the nervous system, traumatism, fungus involvement have all been cited as causal.

Furrowed nails are characterized by transverse thinning which forms depressions or furrows. This has chiefly been observed in association with fevers, and other severe constitutional affections, and it has started also at the time of seasickness, and following injury of the limb. Longitudinal striations or furrows have been observed, but their cause is unknown.

Spoon nail is another form of atrophic thinning in which the size and to a less extent the intervening portions become everted, causing a scoop-like depression. This anomaly is rare and generally occurs in emaciating diseases, although it has been observed without a determinable cause.

FIG. 220.—Atrophy of the nails.

Shedding of the nails occurs at times subsequent to fevers and nervous diseases. It may be associated with alopecia areata and general hair fall. The shedding may be observed in diabetes, erythema scarlatinoides, dermatitis exfoliativa, and in certain instances no cause can be discovered. An hereditary history is at times obtained, and the condition has developed congenitally.

White nails (gift spots; leukonychia; leukopathia unguium) in its mildest form is a common condition, and is characterized by chalky white spots or less frequently of a white band formation. Otherwise the nails are normal. They develop in proximity to the lunula, and as the nail grows they push forward, as they are an integral part of the nail. Trauma has apparently been causal in some instances. The band type has been observed following relapsing and also typhoid fevers. A few of the reported instances have apparently been congenital; hereditary tendency has been

observed in at least one family. In very rare instances the entire nail is white. One nail or all the nails of both hands may be involved. Ringed hairs, alternating white areas and the normal color, may be occasionally seen with leukonychia.

Treatment.—The treatment of all of these cases is practically the same. The cause if determinable should be ascertained and removed by the proper remedies. Arsenic is the sovereign remedy in a considerable number of the cases. It frequently has to be given over a considerable period, and for an adult Fowler's solution should be given in doses not larger than 5 minims (0.32) three or four times daily. Locally a prescription containing ammoniated mercury, 30 to 40 gr. (2. to 2.6) to the ounce (30.)

FIG. 221.—Leukonychia (white nails).

of petrolatum, or with the addition of salicylic acid, 10 gr. (0.65), should be thoroughly rubbed in twice daily. Weekly exposures of the roentgen-rays, in $\frac{1}{4}$-unit doses, continued frequently over some weeks, is of great help. Very little can be done for white nails, excepting as a prophylactic measure, to avoid injury and eradication of any possible underlying condition. Because of the persistence of these atrophic changes treatment has to be continued frequently over long periods.

ONYCHOMYCOSIS.

Synonym.—Fungus invasion of the nails.

Onychomycosis when due to the *ringworm fungus* is termed *onychomycosis trichophytina; tinea trichophytina unguium; ring-*

worm of the nails. When the *favus fungus* is the cause the affection is entitled *onychomycosis favosa; tinea favosa unguium; favus of the nails.*

The lateral portion of the distal end of the nail first becomes involved; the affected area is brittle, friable, grayish, or grayish-yellow in color, and tends to crumble. It may be limited to this small portion or extend to the anterior two-thirds, and rarely the entire nail is involved. Beneath the free end of the nail there may be an accumulation of epithelial matter and débris of a dirty gray or grayish-yellow color. The overlying nail may be raised from its bed by this accumulation. Although the anterior surface is usually first attacked, the disease may start on the lateral or posterior surface, particularly in ringworm invasion, rather than in favus. The clinical appearance in each affection resembles one another closely, although at times in favus, yellowish pin-point- to pin-head-sized areas are seen in the nail. Usually only one or two nails, most often the finger nails, are attacked. Involvement of the toe nails is usually by the ringworm rather than the favus fungus. Ringworm more often invades the nails than does favus; the former may produce the disease primarily at this site, but usually secondary to some other focus, such as the scalp; while favus very rarely attacks the nails primarily. The *endothrix* variety of the trichophyton fungus is the one usually found in ringworm of the nails.

Diagnosis.—The presence of ringworm or favus elsewhere on the surface is of help in the diagnosis. The affected nails should be scraped with a dull piece of glass and the scrapings placed on a glass slide in a few drops of liquor potassæ; the microscopical findings of the fungus proves the diagnosis.

Prognosis and Treatment.—The malady, particularly favus, is extremely obstinate to treatment. Personally, I think the roentgen-rays offer the best chance of cure; $\frac{1}{4}$ to $\frac{1}{2}$-unit exposures are given. The nail may be scraped with the dull edge of a piece of glass daily, if not too irritating, and prolonged soakings carried out in a solution of mercuric chloride, 1 to 3 gr. (0.06 to 0.18) to the fluidounce (30.) of water, for five to ten minutes or longer twice daily; and, in the meantime ammoniated mercury, 1 dr. (4.) to the ounce (30.) of petrolatum, is worn. The affected part may be soaked in a 15 to 20 per cent solution of sodium hyposulphite and bandaged with an ointment of precipitated sulphur, 1 dr. (4.) to the ounce (30.). Sabouraud suggests a lotion composed of 15 gr. (1.) of iodine, 30 gr. (2.) of potassium iodide and 1 quart of water (960.), which is applied on absorbent cotton and kept covered with a rubber finger-stall and renewed frequently. In obstinate cases it may be necessary to remove the nail and then apply the preparations mentioned above.

CLASS 12.

DISEASES OF THE MUCOUS MEMBRANES.

LEUKOPLAKIA.

Synonyms.—Smoker's patches; Leukokeratosis buccalis.

Symptoms.—A disease which attacks the mucous membranes of the tongue, the inner surface of the cheeks, the gums, the lips, the floor and roof of the mouth, and rarely the vagina, or genitals of either sex. The disease is characterized by one, several, or more rounded, irregularly shaped or diffused, often more or less thickened, whitish patches, with at times a tendency to fissure.

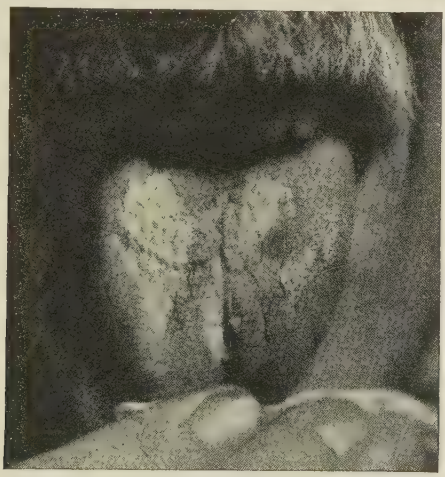


FIG. 222.—Leukoplakia of the tongue. (Courtesy of Dr. M. B. Hartzell.)

The patch may start with an increased redness, or slight bluish tinge of the affected parts, or the papillæ may be slightly raised, and there is a variable degree of sensitiveness to hot and acid foods. After some weeks or months the diagnostic whitish and opaline appearance is observed. The original whitish lesions may appear as parallel, short or long, straight or crooked lines, or as scattered or grouped pin-head- to small pea-sized spots. These areas run together and form the larger plaques. The surface is smooth, roughened, or somewhat papillomatous, and there may be an

encircling hyperemia. The lesions run a chronic course, and ulceration and malignant change may occur, or after reaching a certain development they may remain more or less stationary.

Etiology and Pathology.—Although syphilis has been given as the cause of the affection, in those cases seen in this country it is only one of the etiological factors. The conditions which predispose to or aggravate leukoplakia are excessive smoking, alcoholic beverages, hot, highly seasoned, irritating, and acid foods, various gastro-intestinal disturbances, and sharp or rough teeth.

Histologically there is a keratosis, thickening of the superficial layers and deeper strata, a down growth of the epithelial processes, and in addition some obliteration of the papillæ. There is an inflammation and infiltration of round cells in the corium, later sclerotic changes occur.

Diagnosis.—The chronicity and white color readily differentiate the condition from a syphilitic mucous patch.

Prognosis.—There is always the danger of an epitheliomatous degeneration of the patch.

Treatment.—Smoking and alcoholic beverages should be absolutely eliminated, and also the various articles, mentioned under etiology, which are irritating. If there is a possibility of syphilitic infection, the proper treatment for that affection should be tried. Mild applications or the total destruction of the diseased area are indicated, otherwise a malignant tendency may be stimulated. Mild and slightly astringent mouth washes may be used. Roentgen-ray or radium may be employed. The area if not too extensive may be fulgurated or the Paquelin cautery applied. If the tongue is affected and an epithelioma is developing operation may be the last resort.

FURROWED TONGUE.

This condition is observed upon the dorsal surface of the tongue, and consists of deepening of the central furrow, parallel linear depressions, or of a network of lines and depressions. The surfaces of the furrows are usually smooth and without fur, but when deep they may be irritated by the accumulation of particles of food. In its mild form it not infrequently occurs.

The affection may be congenital, or observed in certain families, and develops spontaneously, and as the result of irritation of an enlarged tongue (*macroglossia*). It has also been observed in association with glossitis, syphilis, and other diseases. Rarely it has been the starting-point of epithelioma.

The mouth and tongue should be kept scrupulously clean, and a boric acid wash used.

TRANSITORY BENIGN PLAQUES OF THE TONGUE.

This rare malady appears as one or several small, pin-head-sized grayish, well-defined, slightly elevated spots on the lateral and anterior portion, exceptionally on the under surface of the tongue. The patches spread peripherally; the border is of a brighter red than the central portion, which may show superficial exfoliation or desquamation. The spreading border, however, may be of a yellowish, grayish, silvery-white, or bluish color. A fully developed patch is usually one-half inch in diameter, at times larger. There is a tendency for these areas to disappear, the central portion first becoming of a normal aspect. An individual plaque runs a course of two to ten days. New spots may continue to appear over weeks, months or indefinitely, or there may be periods of absolute freedom. In most instances there are but one or two areas present at any one time, or several patches may coalesce, enlarge and give rise to the grotesque appearance known as "*geographic tongue.*" Itching may be present to a slight degree, but is usually absent.

Etiology.—It is most often seen in very young children, although both sexes and any age are attacked. The cause is unknown. It has been attributed to syphilis, gastro-intestinal disturbances, trophoneurotic conditions, various fevers, eczema, and to an inherited tendency.

Diagnosis.—The benign, peculiar, and transitory character of the affection distinguish it from all others.

Prognosis and Treatment.—Although persistent, children may outgrow the tendency. Gastro-intestinal care either as to diet or proper medication seems to be helpful. Arsenic has apparently lengthened the intervals between relapses. Mild antiseptic mouth washes, such as boric acid solution, may be used.

BLACK TONGUE (HAIRY TONGUE).

This rare affection is usually found immediately in front of the circumvallate papillæ. It usually develops gradually, at times suddenly, and spreads peripherally; the reverse is observed in its disappearance. The color is generally black, although it may be yellow or blue. The condition may consist simply of discoloration but most often there are thin, filiform projections, of a blackish color, which resemble seaweed or hair. These projections in certain instances are quite long.

The cause is unknown. It occurs in both sexes and at any age, but usually in adult males. It has been attributed to syphilis, gastro-intestinal disorders, various irritants, such as excessive

smoking, etc. The most plausible explanation is a microbic infection, the color probably being due to chromatogenous organisms.

The affection may persist for weeks, months, or years, and then disappear spontaneously, or remain indefinitely. Treatment has very little effect on the course of the malady. Gastro-intestinal regulation as to diet and treatment should be carried out. The mouth is to be kept scrupulously clean. Glycerite of tannic acid may be applied locally, in addition to scraping off the filaments.

Fig. 223.—Black tongue. (Brosin.)

SUPERFICIAL ATROPHY OF THE MUCOUS MEMBRANES OF THE MOUTH AND TONGUE.

According to Hazen, there is an atrophy of the mucous membranes without any signs of inflammation. The affected areas were rounded or oval in shape, glistening white in color, free from induration, and resembled atrophic scars. Sensation in the patch was slightly decreased: subjective symptoms were absent.

CHRONIC SUPERFICIAL EXCORIATION OF THE TONGUE.

Synonym.—Moeller's glossitis.

The condition was originally described by Moeller in 1851, and is characterized by the formation of irregular, usually sharply defined, intensely red spots, showing some elevation of the papillæ. The epithelium on the involved areas had either desquamated or

become greatly thinned and the papillæ were thin and swollen. The patches showed an abnormal secretion and some became ulcerated. Lateral extension occurred in some, but the tendency was to persist in the same size and outline. Severe and persistent or paroxysmal attacks of pain may be present. Acids and highly seasoned foods were irritating. Taste was normal and the sensibility of the tongue unaffected. Treatment has proven unsatisfactory.

Fig. 224.—Lozenge-shaped median glossitis. (Brocq-Pautrier.)

RETENTION CYSTS OF THE MUCOUS MEMBRANE OF THE LIP.

These cysts vary in size from a pin-head to a small hazelnut. They are usually located in the lower lip, at a point overlying the left cuspid tooth. They are paler in color than the mucous membrane. Treatment consists of incision and cauterization of the base or the electrocautery may be employed.

CHEILITIS GLANDULARIS.

The disease usually attacks the vermilion portion of the lower lip, and at times the adjacent skin. The lip becomes swollen, tense, at times painful, and the mucous glands are enlarged to the size of a hemp-seed or larger, with dilated follicular openings, into some of which a fine probe can be introduced. A thin serum, a mucoid, or mucopurulent fluid exudes from these openings. Crusting or scale formation is observed, and the lips are not uncommonly glued together upon awakening in the morning. Occasion-

ally furuncles and abscess-like lesions develop on the adjoining skin surface. The cause is unknown. It is distinguished from cheilitis exfoliation (mentioned under Eczema) by the greater frequency, the persistent exfoliation and crust accumulation in the latter. The disease usually is observed in early or middle adult life. Care of the gastro-intestinal tract, cleanliness of the mouth, and mild antiseptic lotions, such as boric acid, may be used. Roentgen-ray therapy is helpful in certain instances.

FORDYCE'S DISEASE.

An affection characterized by the appearance of whitish or yellowish, scanty or abundant, discrete, aggregated, or coalesced, milium-like bodies, which occur along the lateral line of the teeth, on the vermilion or mucous and inner surface of the lips. There are generally no subjective symptoms; occasionally, however, in extensive cases, slight itching, burning and stiffness of the lip may be experienced. The condition is of frequent occurrence in a mild degree, most often being observed in adult males. There is a granular change in the protoplasm of the cells. The growth and increase in the number of lesions is favored by gastro-intestinal conditions. The condition is trivial and no treatment is required.

LA PERLECHE (PARASITIC DISEASE OF THE LIPS).

The affection attacks especially the commissures of the lips, at times the vermilion, the mucous membrane of the inside of the mouth, and occasionally the adjacent skin. It occurs almost exclusively in infants and young children in certain districts of France. It begins with a blanching of the epithelium, which has a sodden appearance, and there is frequently some underlying and surrounding hyperemia, inflammation, thickening, crusting, and deep fissuring, with a tendency to bleeding. There may be slight itching.

The affection is contagious and spreads rapidly through maternity hospitals, foundling homes, etc., supposedly by means of the water, drinking cups, spoons, and other utensils. It is due either to a staphylococcic or streptococcic infection.

The disease runs a course of a few weeks to one or two months. Mild antiseptic lotions, such as boric acid, are indicated. The child should use individual utensils.

THRUSH.

Synonym.—Sprue.

There develops in infants, occasionally in adults who are unhygienic in the care of their mouths, lesions which resemble deposits

of coagulated milk, but are adherent, and when forcibly removed give rise to bleeding points on the surface of the mucosa. The areas of attack are usually the lateral margin of the tongue and the inner surface of the cheeks, less frequently the pharynx. The integument in rare instances is attacked.

Etiology.—The causes of the disease is a fungus, very probably the Saccharomyces albicans. Lack of cleanliness and lowered resistance on the part of the individual contribute toward the invasion of the organism.

Treatment.—Cleanliness is the most important prophylactic measure. Cure is usually readily effected by using mild mouth washes such as borax, bicarbonate of soda, or boric acid.

VINCENT'S DISEASE.

Synonyms.—Trench mouth: Vincent's angina.

The condition is characterized by irregularly shaped, superficial ulcers, covered with a whitish, greenish or gray-colored membrane. Forcible removal of this membrane shows a tender, sensitive, raw and bleeding surface.

There is usually some elevation of temperature and the submaxillary and cervical glands are swollen. There is a strongly fetid odor from the mouth and salivation is usually a noticeable feature.

The Bacillus fusiformis and Vincent's spirillum are the causative organisms present.

Treatment.—Treatment consists of arsphenamine intravenously. This preparation used locally on the lesions as a powder, in glycerin or in an aqueous solution (1 to 1000), is almost a specific.

CLASS 13.

ACUTE ERUPTIVE FEVERS.

As dermatology in its broadest sense includes any outbreak upon the skin, it is well in a work of this character to include the various exanthemata, and in addition those infectious diseases which are at times accompanied by an eruption.

SMALLPOX (VARIOLA).

Definition.—Smallpox is an acute infectious disease characterized by an initial fever of about three days' duration, succeeded by an eruption passing through the stages of papule, vesicle, and pustule, ending in incrustation, and leaving pits or scars; the fever either intermitting or remitting in the papular and increasing in the pustular stage (W. M. Welch).

Symptoms.—The average incubation period of the disease is from ten to twelve, exceptionally, eight to fourteen days.

The *stage of invasion*, or initial stage, usually begins with a marked chill, which is followed by a rapid elevation of temperature. The fever may be 103° or 104° F., and occasionally with a greater elevation. The pulse is full, tense, and accelerated, frequently not in proportion to the pyrexia. Nausea and vomiting occur with great frequency, particularly in severe cases. Headache is often extremely severe, and backache is present in over one-half of the cases. If the temperature is extremely high there may be delirium. Convulsions are frequently observed in children. The milder the onset the less profuse is the outbreak, while the converse is likewise true.

Peculiar *prodromal rashes* are often observed on the second day of invasion, which usually disappear in from one to two days. The usual rash is that resembling measles and less often a scarlet-fever-like outbreak, rarely an urticaria-like, or hemorrhagic type is observed. The prodromal hemorrhagic rash is frequently the precursor of the malignant hemorrhagic smallpox, although it may precede a mild outbreak of the usual type. Instances of supposed smallpox have been reported in which there was the typical onset, one of the prodromal rashes, but no smallpox lesions.

Stage of Eruption.—The true eruption of smallpox appears on the third day after the initial invasion. The outbreak first appears on the forehead, near the hair-line, other portions of the face, and upon the wrists, spreading rapidly to the scalp, face, neck, ears, forearms, and hands. In the course of twenty-four hours or less it extends to the body and the legs. The outbreak continues to increase for two or three days before it reaches its height. The

FIG. 225.—Smallpox (typical outbreaks).

lesions develop as small red spots which become in twenty-four hours elevated shot-like papules. On the third day of the outbreak many of the lesions contain a clear serum, and by the fourth or fifth day all of the papules have become vesicles with cloudy or milky contents. These lesions reach their full development about the seventh or eighth day. A considerable number of the vesicles have a central depression or umbilication, which is diagnostic.

PLATE XII

Smallpox (Typical Distribution).

Notice the eruption on face is crusting while the remainder is at its height.

Stage of Suppuration.—The contents of the vesicles by the sixth day are yellow and purulent. They lose their umbilication and become large and globular. This suppurative stage is first observed on the face. The reddish areola becomes of a brighter red and broader. If the lesions are numerous and close together, as upon the face, there is a considerable amount of swelling, the eyelids may be entirely closed. The lips, nose, and ears frequently share in the process. Lesions are also observed in certain cases upon the lips, the buccal and nasal mucous membranes, the tongue, the pharynx, and occasionally the larynx.

The second or third day after the appearance of the eruption the temperature falls and the original symptoms lessen in severity or disappear. When the suppurative stage is reached the temperature again rises and continues high, proportionate to the extent of the eruption. Headache, restlessness, and delirium frequently occur during this stage, and a typhoid state may develop.

Period of Involution (Stage of Desiccation).—The swelling and tumefaction lessen and the pustules begin to dry up, starting in the center of the lesion. This drying process leads to a secondary umbilication, and is frequently accompanied by intense itching. The face having been the first portion of the body attacked, shows the crust formation before other parts. The scabs (crusts) are shed in from three to four weeks' time, making the entire duration of the disease approximately five or six weeks. The sites of the crusts are originally red, and some weeks or months later white scars or pits remain, which are most marked on the face.

The outbreak of smallpox may consist of a large number of lesions or comparatively few. In most instances they remain discrete, but confluence may occur. In *confluent smallpox* all of the symptoms are more severe, the lesions more numerous, becoming confluent, and the result is more often fatal, or the convalescence is prolonged.

Petechial, purpuric, and hemorrhagic smallpox (*black smallpox*) are the terms applied to the most malignant type of the disease. The original symptoms are usually severe, and hemorrhages are observed between or in the lesions, and from the various mucous membranes. The termination is almost invariably fatal.

Various complications are associated with or follow smallpox such as erysipelas, boils, abscesses, impetiginous or ecthymatous outbreaks, diseases of the eyeball, the middle ear, the respiratory tract, the joints, and pneumonia. Gangrene of the skin, particularly the scrotum, may develop and lead to a fatal result.

Varioloid (Modified Smallpox).—This term is applied to cases which have been previously vaccinated, usually a considerable

period before the smallpox is acquired, and is characterized by mild symptoms in the initial stage, a very scanty eruption, at times one to a dozen lesions, and no secondary rise in temperature.

Etiology and Pathology.—Smallpox is extremely contagious and anyone may acquire the disease, excepting they are protected by a recent vaccination. It is infectious in all of its stages, but least during its initial stage and greatest during the suppurative and early desiccative periods. The infection may be conveyed by direct contact, through infected garment or other articles, and for a considerable distance through the air. Although the disease is probably due to some microörganism its exact nature has not been ascertained.

Unna has found peculiar degenerations of the protoplasm of the epithelial cells, which he has termed reticulating and ballooning colliquation (softening).

Diagnosis.—Smallpox has to be differentiated from chicken-pox, pustular syphiloderm, impetigo contagiosa, and iodide and bromide eruptions.

Smallpox.	Chicken-pox.
Prodromal period of three days of fever, headache, backache, etc.	No prolonged prodromal symptoms.
Disease starts on the face and is most marked on the uncovered parts of the body and the extremities rather than trunk.	The covered parts mostly attacked, particularly the back.
Start as red spots, shortly becoming papular (shot-like), after three days vesicular; start to become pustular on the sixth day; several different types of lesions present at the same time; lesions are multilocular and are broken with difficulty; lesions umbilicated; crusts form in from six to twelve days; crusts are thick and very dark.	Start as vesicles; appear in crops and of variable size; lesions are unilocular and rupture readily; not umbilicated, excepting when they start to dry up; crusts are formed in from two to four days; the crusts are thin, brown and friable.
Mucous membranes are frequently attacked.	Mucous membranes show fewer lesions.
Numerous scars remain after the disease is cured.	Comparatively few scars remain as the result of the disease.

Pustular syphiloderm (varioliform syphiloderm) has no three-day prodromal period. The outbreak is as abundant on the covered, as on the exposed portions of the body; there are no vesicles present, the papules are not shot-like, and they frequently have small pustular summits. There is a general glandular enlargement; frequently also mucous patches. The initial lesion can usually be found. There are no generally marked constitutional symptoms. The Wassermann test is positive and spirochætæ can be found in the lesions.

Impetigo contagiosa consists usually of but few lesions which are frequently limited to the face and scalp. The outbreak starts

as a vesicle or pustule, never a papule, which dries up in a few days into a honey-colored stuck-on crust. There are no constitutional symptoms.

Drug eruptions caused by the ingestion of the *bromides* and *iodides*, at times, closely simulate smallpox. There are no constitutional symptoms, a history of taking the causal drug can be obtained, and the outbreak is frequently limited to the face, shoulders, and back, although a few lesions may be found elsewhere.

Prognosis.—The prognosis is based almost entirely upon whether the patient has been vaccinated and how recently this prophylactic measure has been performed. In addition the age of the patient and the virulence of the infection have to be considered.

Treatment.—The itching is helped by lint masks soaked in glycerin and ice water. Dusting powders containing 5 per cent of iodoform or 15 per cent of aristol assist in eradicating the offensive odor. Prolonged baths, some of which contain the bichloride of mercury (1 to 10,000 to 1 to 20,000) or creolin, 1 to 500, reduce the temperature and guard against septicemia in the suppurative and desiccation stages. The pustules may be opened and the base swabbed with bichloride of mercury (1 to 5000). Tincture of iodine may be used to assist in the prevention of deep scarring. The red-light treatment has been tried with doubtful results. The internal treatment is entirely symptomatic.

VACCINAL ERUPTIONS.

Synonym.—Vaccination rashes.

The scope of the present volume will not allow the description of the different types of vaccination lesions and the soreness that may result if proper antisepsis is not carried out.

Generalized Vaccinia.—This outbreak is due to the pure vaccine virus and is divided into two varieties: *Spontaneous generalized vaccinia*; *generalized vaccinia from auto-inoculation.*

Spontaneous generalized vaccinia occurs very rarely, appearing most often between the sixth and ninth days after vaccination, and is characterized by lesions which appear in successive crops. They are first papules, then become vesicles, and later pustules. The affection runs a course of less than three weeks. Any portion of the cutaneous surface may be attacked, and although there are usually but a few lesions present there are at times a considerable number. Fever is absent excepting in extensive cases. In the latter there may be glandular enlargement and other complications.

Generalized vaccinia from auto-inoculation is much the same as the spontaneous variety excepting that the lesions are auto-inoculated.

Malcolm Morris and, later, Frank compiled the following classification of skin diseases associated with vaccination.

1. Due to vaccine virus	Local	Local erythema, dermatitis, local vaccinia; adenitis.
	Systemic	More or less generalized erythema. (Erythema vaccinicum, roseola vaccinica.) Urticaria; erythema multiforme, vaccinia (generalized) purpura.
2. Due to mixed inoculation introduced at time of vaccination or subsequently	Local	Impetigo contagiosa; furunculosis; cellulitis; erysipelas; gangrene; tuberculosis cutis.
	Systemic	Gangrene; pyemia; syphilis; leprosy; tuberculosis.
3. Sequelæ of vaccination		Eczema. Urticaria. Pemphigoid eruptions. Psoriasis. Furunculosis.

Treatment. Too great care cannot be exercised in vaccination in order to prevent infection at the time of or at the site of inoculation. The treatment is either symptomatic or has been already cited under the diseases mentioned.

VARICELLA (CHICKEN-POX).

Definition.—A contagious disease occurring chiefly in children, characterized by a vesicular eruption appearing in crops and accompanied by mild fever, which usually appears synchronously with the cutaneous lesions.

Symptoms.—The average incubation period of the disease is from fourteen to seventeen days.

The disease in most instances starts without prodromal symptoms, excepting in adults. In the latter there may be slight malaise, chilliness, and mild fever, rarely the symptoms are more severe, which precede the eruption by some hours, one or two days. The lesions are all vesicles which frequently develop on a transitory purplish-red spot. The face or back are the areas usually first attacked. The majority of the eruption, in most instances, is observed upon the trunk. The face is frequently sparsely attacked; the hands show very few lesions. The lesions appear in crops over some days. The vesicles are unilocular, have clear contents, later cloudy and purulent, and rupture readily. They are not umbilicated, excepting when they start to dry up. The mucous membranes may be attacked. The vesicles dry to crusts in from two

to four days. The crusts are thin, brown, and friable. Comparatively few scars remain as the result of the disease.

There are usually few complications or sequelæ of chicken-pox; the most frequent is a staphylococcic infection (impetigo); in addition boils, subcutaneous abscesses, glandular enlargement, and rarely erysipelas and pyemia develop. Disseminated gangrenous areas are occasionally developed. (See *Varicella Gangrenosa.*)

Fig. 226.—A severe attack of chicken-pox, showing lesions in various stages of development (fourth day). Relative sparsity of lesions on the face as compared with the trunk. (Welch and Schamberg.)

Etiology and Pathology.—Most cases develop in early life. The pathological changes are very much the same as in smallpox, only to a less degree.

Diagnosis.—Its differentiation from impetigo contagiosa and smallpox is found under the latter disease.

Prognosis.—In almost all instances the patient recovers.

Treatment.—Internal treatment, excepting for a mild laxative, is rarely required. If there is any fever the patient should be kept in bed and the diet should be restricted. Equal parts of tincture of iodine and alcohol have been exploited as a local application to prevent scarring in facial lesions. If there is considerable crusting ammoniated mercury, 20 gr. (1.3) to the ounce (30.) of petrolatum may be applied if the surface is not too extensive. For the itching a lotion containing carbolic acid, ½ fl. dr. (2.); boric acid, 1 dr. (4.); glycerin, 40 minims (2.6); camphor-water, 4 fl. oz. (120.), may be employed.

SCARLET FEVER (SCARLATINA).

Definition.—An acute infectious disease characterized by fever, angina, a diffuse punctiform rash which appears on the second day, and desquamation.

Symptoms.—The average incubation period is three to seven days. The disease may be divided into three stages: *The stage of invasion, the eruptive stage,* and *the stage of desquamation.*

The disease starts suddenly with indisposition, fever, headache, vomiting, and sore throat. Vomiting is the most frequent initial symptom with children and sore throat in the adult, while convulsions may be observed in infants. The temperature rises rapidly, 102° to 104° F. being reached in a few hours, and remains high until the eruption has fully developed. The temperature gradually declines as the eruption fades. The pulse is frequently much more rapid than the temperature would indicate.

There is general redness of the throat, which increases in severity, and swelling and edema are observed with the appearance and progress of the rash. There may be a thin, grayish or yellowish film upon the swollen tonsils. A punctate redness, similar to that on the skin, may be observed on the soft palate, uvula, and buccal mucous membrane.

The tongue at the beginning of an attack is usually covered with a grayish-white fur. The tip and edges become a bright red or scarlet, with a roughened granular appearance, and the papillæ on the dorsal surface of the tongue become elevated above the surrounding surface. About the fourth day of the disease the tongue desquamates and a red, raw-looking, often glazed surface, studded with enlarged papillæ, is observed. These papillary elevations are small or large, numerous or scanty. This appearance has been termed "raspberry tongue" or "strawberry tongue," and is of diagnostic importance.

PLATE XIII

Scarlet Fever. Extensive Desquamation Following a Severe Rash.

(Welch and Schamberg.)

Stage of Eruption.—The rash usually develops within twenty-four hours of the onset of the illness, starting usually upon the neck and spreading rapidly to the chest, face, abdomen, arms, and legs. In mild cases the eruption reaches its height in approximately two days, while in severe instances its greatest intensity is observed on the third or fourth day. The rash of scarlet fever is of a bright, dull, or dusky red color, varying somewhat according to the coloring of the individual. Taking the eruption as a whole it resembles a uniform reddish blush, but upon careful examination it is found to be composed of innumerable reddish points somewhat

Fig. 227.—Well-marked desquamation upon the dorsum of the hand and fingers. (Welch and Schamberg.)

deeper in hue than the intervening skin. A curious circumoral pallor is often observed. Although usually general in distribution the surface may be only partially covered, or so faint in places as to be scarcely visible. Small raised papules and also miliary vesicles may be present.

Desquamation begins upon the portions of the body first showing the exanthem, and therefore usually first the face and then the neck and chest. This peeling may be observed as early as the fourth day, but usually the sixth or seventh. The exfoliation, excepting of the hands and feet, is of a bran-like or powderly character; on the latter areas large flakes are shed and occasionally the

entire horny layer is thrown off like a glove or slipper. The skin becomes harsh, dry and wrinkled before the onset of desquamation. Peeling may be slight or profuse, depending upon the severity of the rash. In mildest instances of the disease desquamation may entirely cease in two weeks, while in others, either severe or mild, the process may be prolonged to nine weeks; the average is six weeks. Itching may be slight or severe.

Lymphatic glandular enlargement is almost always present in scarlet fever. In addition the lymph nodes and the lymphoid tissues of the liver, spleen, and intestines share in the hyperplasia. The lymphatic glands of the neck not infrequently suppurate.

Malignant scarlet fever is a rare manifestation of the affection. It starts suddenly, with extremely high temperature and profound nervous symptoms. The patient is overwhelmed by the poison and death sometimes occurs within the first forty-eight hours of the disease, at times even before the appearance of the eruption. The rash is irregular in distribution, it may be hemorrhagic, and bleeding may occur from the various mucous membranes (*hemorrhagic scarlet fever*).

Complications.—Complications are of frequent occurrence. Of these otitis media is one of the commonest, usually developing during the second week of illness. In addition several others are observed, such as suppuration in the mastoid cells, meningitis, thrombosis, abscess of the brain, a mild form of arthritis, abscess of the neck, endocarditis, pericarditis, myocarditis. Pneumonia and pleurisy occasionally occur during convalescence. Eye complications are rarely serious.

Albuminuria is of rather frequent occurrence. It may develop as an early stage of the disease, but usually appears from the fourteenth to the twenty-first day as the result of postscarlatinal nephritis.

According to Welch and Schamberg, diphtheria complicated scarlet fever in from 10 to 15 per cent of the cases admitted to the Municipal Hospital, Philadelphia.

Etiology and Pathology.—The cause of the disease is unknown, although it is believed to be a streptococcic infection. There is a pronounced leukocytosis present and an early increase in the eosinophiles. The disease is communicated by direct contact and infected articles. It usually attacks children.

Diagnosis.—Scarlet fever is to be particularly distinguished from erythema scarlatinoides; the differential points are given under the latter disease. The marked symptoms and the course of the affection distinguish it from the various drug and toxic rashes.

Desquamation in rings from palmar sweating should be readily distinguished. Scarlet fever is differentiated from measles and rubella under those diseases.

Prognosis.—The character of the prevailing epidemic, the age of the patient, the severity of the attack, and the various complications influence the prognosis. The death rate varies from 4 to 8 per cent in the mild epidemics to 30 per cent in those most severe.

Treatment is chiefly symptomatic.

RUBEOLA (MEASLES).

Synonym.—Morbilli.

Definition.—An acute contagious disease characterized by fever, a catarrhal inflammation of the upper respiratory mucous membrane, and a blotchy, macular rash which appears about the fourth day of illness.

Symptoms.—The incubation period is usually from ten to eleven days, the eruption appearing in most instances on the fourteenth day.

Initial Period.—The disease starts with sneezing, coryza, slight fever, chilliness, or occasionally a distinct chill. The nose runs, the eyes are irritable, the tongue is coated and the fauces are reddened. Toward the end of this period a punctiform eruption is seen on the mucous membranes of the mouth with the exception of the tongue. The buccal mucous membrane opposite the molar teeth exhibits in most cases minute bluish-white specks at the summits of red spots (*Koplik's spots*). These symptoms become more severe; the temperature becomes higher, laryngitis and bronchitis develop, and the patient feels generally miserable. The initial stage lasts usually four days, occasionally for a shorter or longer period.

Eruptive Stage.—The outbreak first appears on the face and neck and spreads rapidly over the trunk. It makes its appearance as small red spots, which increase in number and size. The eruption is macular, occasionally becoming papular. The outbreak when fully developed has an irregular crescentic outline with intervening normal skin. This characteristic formation is most marked upon the chest, abdomen and back. The face may be swollen and there is some enlargement of the lymphatic glands. The eruption is most marked on the face on the second day, and on the trunk on the third day, at which time it starts to fade from the face. On the fourth day it starts to fade from the trunk and extremities. After the disappearance of the active eruption yellowish-brown pigmented areas remain for several days, giving the skin a distinctly mottled appearance.

The fever and catarrhal symptoms remain or increase when the eruption appears. When the eruption starts to fade the catarrhal

symptoms start to improve and the temperature falls rapidly to normal.

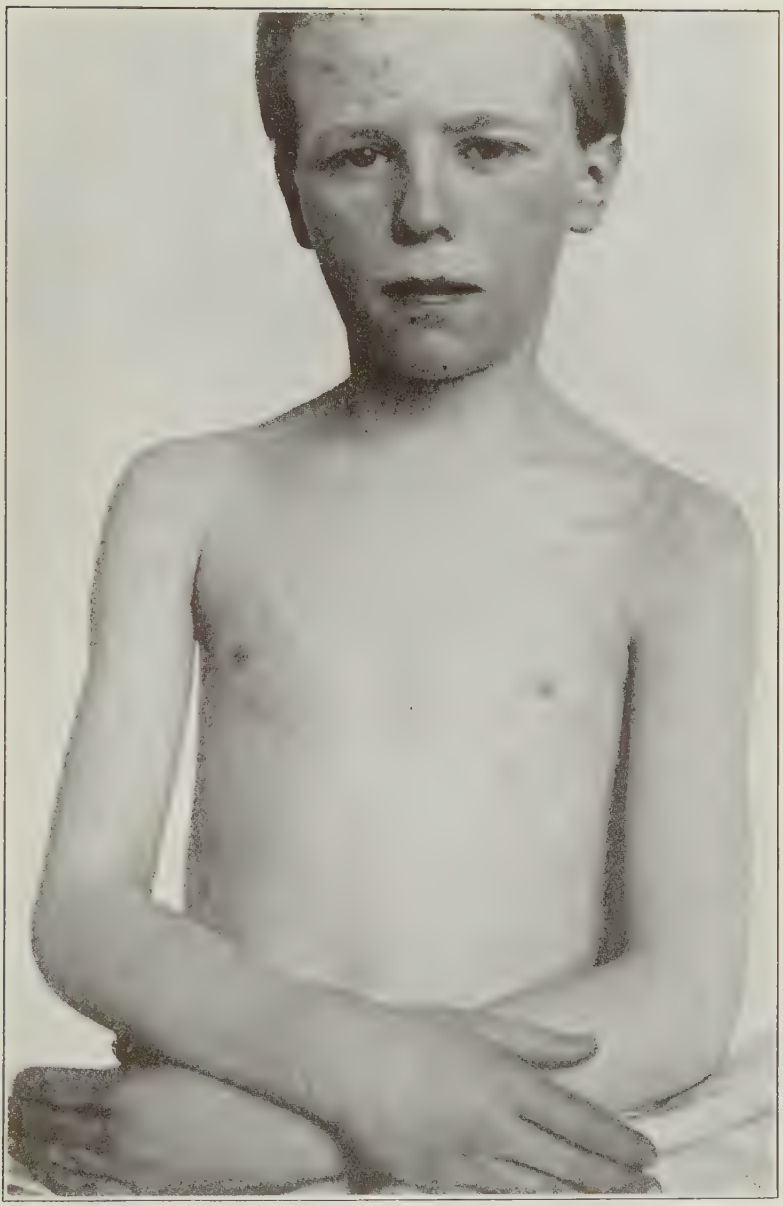
Slight desquamation of a furfuraceous character follows the disappearance of the eruption.

FIG. 228.—Boy exhibiting eruption of measles which developed during convalescence from smallpox. (Welch and Schamberg.)

FIG. 229.—Cancrum oris (gangrenous stomatitis) following measles. Child, aged four years.

Rarely the rash may be of a hemorrhagic character. In the usual type of measles all grades of outbreak may be observed from small to large lesions, and a scanty or very profuse eruption.

PLATE XIV



Eruption of Rubella, Showing Discrete but Closely-set Macules.

(Welch and Schamberg.)

The most frequent complication is an inflammation of the respiratory tract, such as bronchitis or bronchopneumonia; and less often lobar pneumonia. There may be symptoms of spasmodic croup from laryngitis. In severe cases diphtheritic laryngitis or membranous croup develops. Other complications which may develop are iritis, blepharitis, keratitis, apthæ, ulcerative stomatitis, gangrenous stomatitis or cancrum oris.

Etiology. Measles is the most contagious of the various exanthemata. The cause is unknown, although it is probably caused by some microörganism. It is contagious from the beginning of the symptoms until the complete disappearance of the skin eruption.

Diagnosis.—It has to be particularly distinguished from rötheln (*German measles*). This differentiation is given under the latter disease. Drug rashes can be excluded by the lack of constitutional and catarrhal symptoms. Fatalities are comparatively unusual, excepting in very young children, debilitated subjects, or in those cases complicated by pneumonia.

Treatment.—There is no specific remedy that is helpful and treatment is therefore symptomatic.

GERMAN MEASLES (RUBELLA; RÖTHELN).

Definition.—Rubella is a mild contagious eruptive disease which is accompanied by mild fever and usually runs a course of but three or four days.

Symptoms.—The incubation period varies between five and twenty-one days, on an average, two weeks. The prodromal symptoms are either absent or exceedingly mild; if present, there is some malaise, headache, and at times mild catarrhal symptoms of the eyes, nose, throat, and bronchial tubes.

The prodromal symptoms, if present, precede the outbreak by a few hours, one or two days. The most noteworthy prelude to the eruptive stage is the enlargement of the cervical glands, and others of the lymphatic system.

Eruptive Period.—The eruption is frequently the first announcement of the disease. The eruption first appears upon the face or the sides of the neck and spreads rapidly to the trunk and arms; the general surface is covered in one or two days. The outbreak reaches its height on the parts first attacked; therefore it may have faded from the face when the lesions on the legs, the last areas attacked, are at their climax. The typical eruption consists of pin-head- to lentil-seed-sized, pale, rose-tinted, slightly elevated spots. The slight elevation of the lesions can be felt on careful palpation. The macules may be somewhat disseminated or closely crowded together. The legs are usually sparsely attacked. The

outbreak persists for from one to five days, usually from two to three. Desquamation is infrequent; if present, it is very fine and bran-like. Complications and sequelæ are rarely present.

Etiology.—The cause is probably microbic, but it is as yet unknown. It is extremely contagious; children are usually attacked.

Diagnosis.—German measles has to be distinguished from measles chiefly and also at times from scarlet fever.

Measles.	Rubella (Rötheln).	Scarlet Fever.
Prodromal stage lasts about four days; catarrhal symptoms are marked; Koplik's spots present; fever moderate.	Prodromal stage usually lasts but a few hours or is absent; catarrhal symptoms absent or slight; Koplik's spots absent; fever absent or slight.	Starts with vomiting, high fever; outbreak usually on the second day; marked sore throat; diagnostic tongue.
Glandular enlargement is absent or slight.	Enlargement particularly of the anterior or posterior cervical glands before or at time of the appearance of rash.	Glandular enlargement usually observed after the rash is fully developed; cervical glands less enlarged than the other lymphatic glands of the neck.
Eruption spreads less rapidly than rubella; rash lasts an average of four to five days.	Eruption spreads rapidly, fading from area first attacked while it is at its height elsewhere; runs course usually of two or three days.	Face less involved by rash than in measles and a circumoral pallor is present; rash fades in five to six days.
Rash consists of pin-head- to bean- or finger-nail-sized slightly elevated, dull red, slightly raised macules, blotchy appearance.	Pale rose red, pin-head- to pea-sized maculo-papules; smaller, paler and more discrete than in measles.	Rash diffuse, punctiform, scarlet red.
Desquamation occurs as fine bran-like scales.	Desquamation does not occur unless the rash has been unusually severe.	Desquamation profuse in large scales or casts and continues for an average of six weeks.
Bronchitis, bronchopneumonia may result.	Complications are absent; symptoms are so mild patient is not in bed.	Complications and sequelæ frequent; mortality from 4 to 30 per cent.

Prognosis.—Death rarely results, most cases running a short, mild course.

Treatment.—The patient should be guarded against cold draughts. The disease frequently requires nothing but a restricted diet and laxatives. If severe, treat symptomatically.

THE FOURTH DISEASE (DUKE'S DISEASE).

Duke describes a disease which he believes is a separate entity, while some of the other authorities consider it an atypical form of German measles or scarlet fever. It has an incubation period of

twenty-one days. There may be slight sore throat and malaise preceding the outbreak. The rash appears rapidly and covers the entire body in a few hours. The color is brighter than the typical case of scarlet fever. There is a mild degree of temperature, some glandular enlargement, and no sequelæ.

FOOT AND MOUTH DISEASE IN MAN.

The disease is a systemic, epizoötic disorder of cattle, hogs, sheep, goats, and other animals. Man is occasionally attacked, inoculation occurs through abrasions of the skin and mucous membranes, and may follow the ingestion of contaminated milk. The malady is infectious, the virus being present in the fluid of vesicles.

The incubation period of the disease, as it occurs in the human race, is usually two to five days, occasionally ten days. Constitutional symptoms of moderate severity develop, with dryness, burning, congestion, and swelling of the buccal mucous membrane. Two or three days later small vesicles develop on the lips, tongue, and pharynx. The constitutional symptoms tend to subside with the appearance of the eruption. Two to three days after the development of the vesicles, rupture occurs, leaving reddish, extremely tender ulcers which heal with practically no scar formation. These lesions may become enlarged and tender.

In severe instances the extremities may be attacked, the hands more frequently than the feet. The eruption occasionally is of generalized distribution. The lesions on the cutaneous surface are vesicular and tend to rupture the same as the mucous membrane lesions.

The disease in man tends to pursue a relatively mild course, although fatal cases have been reported in severe epidemics. The malady tends to run a self-limited course. Treatment is symptomatic. Mild antiseptic and astringent mouth washes may be employed.

ACUTE INFECTIOUS DISEASES ACCOMPANIED AT TIMES BY ERUPTIONS.

In order to make a book on dermatology complete it would be well to mention briefly, at least, those eruptions which are at times associated with the various acute infectious diseases, including those that are constantly found in typhoid, typhus, and Rocky Mountain spotted fever.

Typhoid Fever.—The characteristic eruption consists of rounded, somewhat circumscribed, rose-colored, slightly elevated, pin-head- to lentil-seed-sized spots, from which the color can be temporarly

pressed. These appear usually on the seventh or eighth day of the disease, at times in children two or three days earlier. The spots appear in crops, separated by three or four days, and usually last from three to five days. There are in most instances one-half to two dozen spots present. Occasionally, particularly in children, a minute vesicle develops on the surface of the lesion. The outbreak most often occurs upon the abdomen, chest, and back.

Other rashes are occasionally observed in typhoid fever, such as a diffuse reddish blush (simple erythema), scarlatinoid erythema, which may be followed by branny desquamation, a rash somewhat resembling measles, urticaria, purpuric or hemorrhagic rashes, sudamina (sweat eruption), prickly heat, furunculosis, atrophic streaks (striæ atrophicæ), and as rare complication, gangrenous dermatitis or disseminated gangrene of the skin. Bed-sores are of rather common occurrence. Herpes (fever blisters) rarely develop.

Typhus Fever.—This affection is commonly accompanied by a rash so much so that the disease has been termed "spotted fever" and "petechial fever." The outbreak usually appears upon the fourth or fifth day of the disease; new spots develop for about forty-eight hours, when the eruption reaches its climax. The lesions first attack the abdomen, the chest, the shoulders, and the back, and the eruption is apt to become generalized with the exception of the face; children showing the lesions on the latter location also. The rash consists of a violaceous mottling and rose-color pin-head- to lentil-seed-sized, ill-defined spots. The color in the beginning can be temporarily pressed from the spots, but gradually the rose-red macules become bluish-purple and the color is not removed by pressure. Hemorrhagic spots may also develop. The rose spots frequently disappear in one or two days, those of a deeper shade fade in five to six days, and the hemorrhagic areas persist for two to three weeks. The disappearance is usually followed by branny desquamation.

Influenza.—The skin of the face may be red and swollen. Occasionally a simple erythema or a scarlatiniform erythema is observed upon the face, the trunk, or extremities, particularly the arms. These appear most often during the early part of the disease. In addition, and usually exceptionally, a papular erythema, erythema multiforme, erythema nodosum, urticaria, fever blisters, herpes zoster, and sudamina have been observed.

Dengue.—There may be in the beginning of the disease a macular, patchy, or diffuse erythema. Later, in the second stage of the disease, a scarlatinal, measles-like or urticarial outbreak may appear on the face, the forearms, the chest, and the palms, or general in distribution. The eruption runs a course of a few hours to two or three days, and is followed by a branny or flaky

desquamation. Severe itching may appear with the fading of the rash. The eruption in certain instances relapses. Fever blisters are rarely seen

Malaria.—Fever blisters are of common occurrence and are supposedly of favorable purport. They not only develop about the mouth and nose, but may also attack the tongue and gums, or other sites.

Other eruptions which have been observed are erythematous rashes, purpura, urticaria, and pigmentation, in the more acute cases, of a yellowish or ashy gray color, and in chronic instances there may be bronzing of the skin. Rarely gangrene of the skin, noma, acne, and furunculosis have developed.

Epidemic Cerebrospinal Meningitis.—In about one-third of the cases a petechial rash has been observed, which ordinarily appears about the third day of the disease. The lesions are of the size of a pin-head to a pea, hemorrhagic, purplish color, and do not disappear under pressure. The outbreak, at times, is finger-nail or larger in size. There are usually but a few lesions present which are located upon the trunk, face and extremities. Rarely, a measles-like rash is present. Herpes are of frequent occurrence. In rare instances, sudamina, urticaria, scarlatina-like erythema, and bullæ have been observed.

Miliary Fever (Sweating Fever).—Various rashes have been observed; an erythema of a measles-like or scarlatina-like variety, and an outbreak consisting of minute, closely aggregated, conical papules, with a miliary vesicular summit. The trunk and extremities and occasionally the face are attacked. The outbreak usually develops on the third or fourth day of the disease, and a branny peeling is observed at the time of its disappearance.

Angina and Tonsillitis.—Rashes have rarely been observed in association with these conditions. Erythemas of the thorax, abdomen and joint areas have occasionally been observed. The outbreak may be of a measles-like, macular, or maculo-papular varieties.

Rheumatic Fever.—There is no diagnostic eruption associated with the condition, but several forms of outbreak have been observed. Sudamina and urticaria are common, because of the sweating. Simple erythema, erythema multiforme, erythema nodosum, scarlatiniform erythema, and purpura, or peliosis rheumatica (Schönlein's disease), have all been occasionally observed. Fever blisters are uncommon.

Rocky Mountain Spotted Fever.—The eruption appears in from three to five days after the onset of the disease upon the wrists, the ankles, and the back, and gradually spreads over the extremities, including at times the palms and soles, and the trunk later

in the affection. It may also involve the mucous membranes of the mouth and throat. The eruption appears in crops. The lesions are first pinkish or reddish macules, which later become darker in color and finally hemorrhagic. Large hemorrhagic areas may occupy a considerable portion of the cutaneous surface in severe cases. In addition to these lesions there may be a yellowish discoloration of the skin. The eruption terminates with desquamation, particularly on the hands, the feet, and the face.

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" Imbricata (Tokelau)

Tinea Versicolor.

Diseases of Nervous System.

pigmentations. May be due to arsenic poisoning

2. Fading Eruption of Indian Cure
3. arsenical Dermatitis
4. Bronzing Diabetes.
5. Mongolian spot (Rare)
6. Pellagra - (Japanese patients)
7. Chloasma (rare)
8. Multiple fibroma (Von Recklinghausen's)
9. Acanthosis Nigricans